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Exploring Professional Development: Supporting the Implementation of Innovative Pedagogies in Physical Education Teaching

Kelly Ann Parry
University of Wollongong

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Exploring Professional Development: Supporting the Implementation of Innovative Pedagogies in Physical Education Teaching.

Kelly Ann Parry

Supervisors:
Dr Dana Perlman, Dr Gregory Forrest, Dr Phil Pearson

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Abstract

Game Centred Approaches (GCAs) have become increasingly popular amongst physical educators because of their potential to enhance educational outcomes. Nevertheless, the literature shows that implementing GCAs can be problematic. The literature reports that the conceptual and pedagogical difficulties and feelings of insecurity, apprehension, and confusion experienced by teachers when trying to implement student-centred pedagogy such as GCAs can create barriers and issues. Emerging yet limited research has been revealed about how best to support teachers to explore what these approaches may look like in their own practice. Research conducted with in-service teachers on how best to support the use of GCA pedagogies to ensure quality outcomes for students is limited. Professional Development (PD) opportunities provide a critical mechanism to facilitate teacher learning, supporting teachers to transform their teaching practice, with links to improved learning outcomes for students. The research identifies a number of characteristics of effective PD, advocating for Professional Learning Communities (PLC) and Communities of Practice (CoP), and Action Research (AR) as effective platforms to support teacher professional learning, leading to informed and improved practice.

This research aimed to examine the influence of a conceptually designed PD model, informed by the research on effective PD practice and in-service teachers' implementation of GCAs. It explored the elements of PD required to support teachers to design (i.e. planning) and implement (i.e. instruction/delivery/assessment) game-centred teaching. The PD was conducted using AR over four phases to examine the study aim: Needs Assessment, Planning, Implementation and Evaluation. Simultaneous data collection and data analysis were conducted across each phase, including focus group interviews, observations and document analysis. Data were triangulated and analysed using deductive and inductive analysis and constant comparison.

The findings of this study report the teachers' experience and responses to the PD model. The teachers' required specific and individualised support when implementing game-centred pedagogy. The findings revealed a range of facilitators and barriers to learning throughout the different PD phases. Analysis of the data showed that the PD model positively impacted the teachers' ability to plan, implement, and assess using GCAs. However, wide variations in

knowledge of GCA use, along with differing attitudes towards the value of GCAs and PD, and reasons for engaging in PD impacted the PD process. Furthermore, the findings indicated that the teaching and learning culture within the school and teacher accountability and time were crucial features of the PLC, significantly influencing the teachers' professional learning.

The findings of this study contribute to the existing body of knowledge by providing recommendations for PD opportunities to support teachers when attempting to implement innovative student-centred pedagogies such as GCAs that may be applied to educational settings in general. It provides suggestions concerning PD by proposing an effective model of PD that may potentially improve educational outcomes for teaching. Doing so presents a theoretical and conceptual framework that provides a guide to developing informed practice.

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Finally, I would like to dedicate this thesis to my Nan; losing you during this time was heartbreaking. You have always stood by my side and supported my dreams and ventures; I value the life lessons you have taught me and will carry them with me always. I vow to always 'count my blessings' and stay mindful that 'as one door closes, another door opens', just as you taught me.

Certification

I, Kelly Ann Parry, declare that this thesis submitted in fulfilment of the requirements for the conferral of the degree Doctor of Philosophy, from the University of Wollongong, is wholly my own work unless otherwise referenced or acknowledged. This document has not been submitted for qualifications at any other academic institution.

Kelly Ann Parry

(31, August 2020)

List of Names or Abbreviations

ACARA: Australian Curriculum, Assessment and Reporting Authority

AR: Action Research

CPD: Continuing Professional Development

CoPs: Community of Practice

DEC: Department of Education and Communities

GCA: Game Centred Approach

PD: Professional Development

PDHPE: Personal Development, Health and Physical Education,

PE: Physical Education

PETE: Physical Education Teacher Education

PLCs: Professional Learning Communities

PST: Pre-service teacher

SE: Sport Education

TGfU: Teaching Games for Understanding

TGM: Tactical Games Model

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Chapter 1

Introduction

Introduction

In this chapter, the research territory is established, situating the research in the broader context and outlining the significance and relevance of this thesis. The study overview is provided, including the study background, purpose, research questions and an explanation of the significance of the study. Definitions of the key terms used within this thesis are also included in this chapter. This section presents a rationale for the research, justifying its need and its contribution to both the instructional model (e.g. Game Centred Approach) and professional development literature.

Background of the study

The importance of teacher professional learning is well documented in the academic literature (See: Armour & Makopoulou, 2012; Bechtel & O'Sullivan, 2006; Borko & Putnam, 1995; Desimone, 2009, Guskey, 2002; Makopoulou & Armour, 2011). The literature discusses professional development (PD) synonymously with educational reform (Sykes, 1996), where improvements in student learning are linked to teacher learning and improved instruction (Desimone, 2009). Most PD research is driven by the impetus that "effective professional development will improve teacher instructional practices, which will result in improved students learning" (Opfer & Pedder, 2011, p.384). High-quality PD is arguably a central component in nearly every modern proposal for improving education (Guskey, 2002), where PD opportunities provide critical mechanisms to facilitate teacher learning (Bechtel & O'Sullivan, 2006). In an Australian context, the Australian Institute for Teaching and School Leadership (AITSL) provide national leadership for the Commonwealth, state and territory governments in promoting excellence in the profession of teaching and school leadership. The charter for the professional learning of teachers and school leaders (The Charter) (AITSL, 2012) claims, improving the quality of teaching in Australian schools is of the highest priority if the ambitious educational goals set out by the Melbourne Declaration (Ministerial Council on Education, Employment, Training and Youth Affairs Melbourne [MCEETYA], 2008) are to be met.

Typical or 'traditional' PD is characterised by individualistic, short-term and decontextualised activities, often in response to bureaucratic or administrative fiat (Day & Sachs, 2004). PD opportunities are typically delivered via a one-off workshop approach, often delivered by an external 'expert' (Sparks & Hirsh, 1997) and involving teachers as passive recipients of information generated elsewhere (Eisner, 1992). Subsequently, the educational literature is fraught with concern, deeming this form of PD as 'deficient' (Fishman, Marx, Best, & Tal, 2003, p. 643), 'woefully inadequate' (Borko, 2004, p.3) and ineffective in supporting teachers to learn in ways that can enhance practice (Armour & Makopoulou, 2012; Armour & Yelling, 2004, 2007). Issues related to time, location, the availability of teacher replacements and cost, along with difficulties transferring and applying learning in the context of their own schools, are highlighted in the literature (Armour & Yelling, 2007). Despite these pitfalls, traditional forms of PD prevail and remain dominant in the educational field, perhaps due to their cost and time effectiveness. Brown (2011) argues that the Physical Education (PE) profession needs to directly challenge the status quo of professional learning.

There has been ongoing research into what and how teachers learn from PD and the impact of teacher change on student outcomes (Borko, 2004; Desimone, Porter, Garet, Yoon, & Birman, 2002; Fishman et al., 2003; Garet, Porter, Desimone, & Birman, 2001). Research in the past decade has provided far more insight into what is deemed effective PD and the processes necessary for teachers continued professional growth and learning (O'Sullivan, 2007; Spalding, Klecka, Lin, Wang, & Odell, 2011). It is reported that to be effective, PD needs to be continuous and sustained over time, teacher-centred, and physically and mentally active (O'Sullivan, 2007; Parker, Patton, & Tannehill, 2012). In order to translate the theory into accomplished practice, teachers need active learning. They learn by doing, reading, and reflecting; by collaborating with other teachers; by looking closely at students and their work; and by sharing what they see (Darling-Hammond & McLaughlin, 2011). Hayes, Mills, Christie and Lingard (2006) argue that "... there is a pressing need to place teacher professional practices, pedagogies and assessment practices linked to desired student outcomes, at the core of professional communities, both within and outside schools" (p. 25). As such, there was a call to action regarding the status of teacher professional learning.

Notably, the last decade has seen a marked change in the landscape and delivery of teacher

professional development opportunities. The endorsement of the Australian Professional Standards for Teachers (The Standards) (AITSL, 2011) in 2010 and the introduction of the mandated accreditation process for all teachers in 2018, including the compulsory professional development hours, have provided increased accountability for teachers' professional learning. These changes have contributed to increased professional development opportunities and professional development suppliers and increased teacher participation in professional learning activities. Moreover, it has provided a catalyst for the change in the provision and delivery of teacher professional learning in Australian schools.

There has been a noticeable shift towards more collaborative and cooperative forms of PD that create 'professional capital', encouraging continuous teacher development, providing a comprehensive set of actions to help teachers learn and move forward (Hargreaves & Fullan, 2012). PD opportunities, often in the form of professional learning communities (PLCs), are one example of this shift. These PLCs have the potential to engage teachers in the development of a collective culture, allowing them to learn from and with each other and to struggle with the uncertainties that accompany their roles as learners and as teachers (Darling-Hammond & McLaughlin, 2011, Patton, Parker, & Pratt, 2013).

A key area of PD, particularly in an Australian context, has been in productive pedagogies and quality teaching (see Hayes et al., 2006, Mills et al., 2009 and NSW, Department of Education & Training, 2003) with a focus on innovative, student-centred practices. Productive Pedagogies are a range of classroom strategies that teachers use to focus instruction and improve student outcomes. Focusing on four dimensions of 'intellectual quality', 'relevance', 'social support' and 'recognition of difference', Productive Pedagogies explicitly attends to both intellectual and social justice outcomes (Gore, Griffiths & Ladwig, 2001). Productive pedagogies initially emerged from the landmark Queensland School Reform Longitudinal Study (1998-2001). Productive Pedagogies was widely adopted in Australia and internationally, both a research tool and metalanguage to support teachers to critically reflect on their practice. More recently, the research of Marzano and Kendall (2007) and their New Taxonomy of Educational Objectives have been used as the basis for the Queensland Curriculum & Assessment Authority's design of the new syllabi and external system of assessment.

In New South Wales, the Quality Teaching Framework (QTF) (see NSW Department of

Education and Training [NSWDET], 2003) provided a model of pedagogy for improving quality teaching in Department of Education schools. In recent years, there has been a resurgence of the model with the Quality teaching rounds (QTR) approach to professional development, developed by the University of Newcastle. The QTR approach combines the ideas of 'rounds', Professional Learning Communities (PLCs) and the QT model to build teachers' capacity to improve the quality of teaching and student outcomes (see Gore, Lloyd, Smith, Bowe, Ellis, Lubans, 2017; Gore & Rickards, 2020; Gore & Rosser, 2019; Miller, Gore, Wallington, Harris, Prieto-Rodriguez & Smith, 2019). In 2019, the NSW Department of Education entered a five-year partnership with the University of Newcastle for Building the Capacity for Quality Teaching in Australian Schools, with the launch of the Quality Teaching Academy in 2020, utilising the QTF as the framework for deep engagement in analysis and review of classroom practice. Chapter two provides a detailed discussion of productive pedagogies and the QTF, specifically within the context of GCAs.

In the discipline of Physical Education (PE), particularly when teaching games, a focus on quality teaching, innovation, and student centred practices has often been in the context of Game Centred Approaches (GCAs). GCAs have become increasingly popular amongst Physical Educators due to their potential to enhance educational outcomes (Butler, 2006; Forrest, Wright, & Pearson, 2011; Fry, Tan, McNeill, & Wright, 2010), along with a range of other benefits, including enhanced participant motivation (Evans & Light, 2008; Mandigo, Holt, Anderson, & Sheppard, 2008) and engagement (Pearson, Webb, & Mckeen, 2006; Wright, McNeill, & Fry, 2009), improved tactical transfer between sports (Hastie & Curtner-Smith, 2006; Memmert & Harvey, 2010; Memmert & Roth, 2007), the development of tactical knowledge (Butler, 1997; Gréhaigne, Godbout, & Bouthier, 1999; Mitchell, Griffin & Oslin, 1997; Mitchell, Oslin & Griffin, 1995; Rovegno, Nevett & Babiarz, 2001) and developing effective decision makers (Díaz-cueto, Hernández-Álvarez, & Castejón, 2010). GCAs or games-based pedagogy are also mandated within the new NSW PDHPE syllabus and Australian curriculum. Research linking GCAs to quality teaching in Physical Education (PE) (Light, 2014, Light, Curry, & Mooney, 2014; Pearson, Webb, & Mckeen, 2006), highlights the capacity of GCAs to enhance the quality teaching of games and address elements such as deep understanding, higher-order thinking, student direction and inclusivity (Pearson et al., 2006).

Nevertheless, the literature has reported that GCAs are challenging to adopt, and the

implementation of GCAs can be problematic. Research reveals the conceptual and pedagogical difficulties (Casey, Dyson, & Campbell, 2009; Dudley & Baxter, 2009; Mcneill, Fry, Wright, Tan, & Rossi, 2008; Roberts, 2011), along with the feelings of insecurity, apprehension and confusion (Butler, 1996; Díaz-cueto et al., 2010; Griffin at al., 1997; Gubacs-collins, 2007) experienced by teachers when trying to implement game-based pedagogy. Subsequently, many authors have attempted to clarify and deepen understandings of original models (e.g., Butler, 2014; Harvey, Pill, Almond, 2018). It is claimed that GCAs impact within the practices of PE has yet to be fully realised and achieved (Pearson et al., 2006; Stolz & Pill, 2013). In their recent review of the application of Teaching Games for Understanding (TGfU) in Physical Education, Barba-Martín, Bores-García, Hortigüela-Alcalá, and González-Calvo (2020) highlight the disparity between research and practice, or more specifically, the dissemination of the TGfU method and its application in school contexts. Their findings show the great contrast between theoretical research or research outside school contexts and those conducted in schools and during PE, highlighting the need to continue addressing PE by understanding the real possibilities of TGfU in the subject.

Subsequently, it is argued that linear, performance-based teaching practices still dominate PE. As such, traditional methods, characterised by skill drills and technique practice prevails. The concern is that these prevailing pedagogical approaches continue to marginalise and alienate students and are insufficient in achieving worthwhile educational outcomes for students (Cothran, 2001; Ennis, 1999; Fitpatrick, 2018; Kirk & MacDonald, 1998; Light & Georgakis, 2005). Research has revealed little about supporting teachers to explore what these games-based approaches may look like in their practice. In an education setting, limited research has been conducted with in-service teachers (Harvey & Jarrett, 2014) and their PD needs concerning implementing these approaches, which may be related to these difficulties. Memmert et al. (2015) suggest further research is needed into teacher development in GCAs, pre-service and in-service teachers learning to teach by using TGfU related approaches and the PD of novice to experienced practitioners as areas for future research focus.

As such, examining teacher learning within the context of implementing GCAs may provide important insight into how best to support teachers in implementing game-based pedagogy, providing a framework for translating theory into accomplished and informed practice. Exploring the characteristics of effective PD and examining the influences on teacher learning, whilst considering the complex nature of learning, will help inform the development

of an effective model of PD that aims to support the successful implementation of GCAs. These factors ensure the proposed model is one that is research-informed and adapted to individual teacher's needs. As such, the model of PD posited sets out to empower teachers and have them address the key constraints in their own school settings.

Purpose of the Study

The purpose of this study was to examine the influence of a conceptually designed PD model, based on the features and characteristics of effective PD, had on implementing an innovative, student-centred teaching approach, namely GCAs, in a school-based PE program.

Aim of the Study

This study aimed to explore teacher learning and gain an insight into why teacher learning may or may not occur as a result of PD activity, specifically in the context of PE and implementing game-based pedagogy. Specifically, this study attempted to understand and gain insight into what role the PD played in teachers' ability to design (i.e. planning) and implement (i.e. instruction/delivery/assessment) game-based teaching. In doing so, it showed how this conceptually designed model of PD-which integrated theories of Professional Learning Communities (PLC) and Communities of Practice (CoP) and the features and characteristics of effective PD as an effective mechanism to support teacher learning-impacted teachers' knowledge, understanding, and implementation of GCAs and more generally the facilitators and barriers the PD program encountered during the phases of PD.

The findings will be discussed with consideration to how the PD program supported teachers in implementing GCAs, and specifically, how the PD program was delivered logistically and facilitated the development of GCA knowledge and application of game-based pedagogy. How the barriers presented in the study were dealt with will also be discussed. These findings and discussion will then be disseminated into the broader context of PD in PE and the broader educational community when using educationally sound and innovative teaching practices.

Research Questions

This research has thus been designed to examine the following research questions:

Overarching Research Question

What are PE teachers' experiences of and responses to a professional development model designed to support their implementation of GCAs?

Secondary research questions

1. What barriers and facilitators impact on teacher professional learning when implementing GCAs?
2. What elements of games-based pedagogy do teachers need support with when learning to teach GCAs?
3. What are the characteristics of effective GCA-PD?

Research Design and Method

In order to examine the research questions, this study adopted a qualitative approach using a hybrid case study and action research design. Each Personal Development, Health and Physical Education teacher within the school context represented an individual case as part of the overall case study. Theoretically grounded in the broad educational theories of constructivism, situated learning and an amalgamation of the key characteristics of Communities of Practice (CoP) and Professional Learning Communities (PLC), this study posited a Professional Development model. Table 1 presents an overview of these key characteristics of CoPs and PLCs identified by Wenger (1998) and Stoll, Bolam, McMahon, Wallace, & Thomas (2006), their similarities and differences and their application to this study. Definitions for both PLCs and CoPs are also provided below. These theories, along with the continuous process of plan, act, observe and reflect, as prescribed by the action research framework (Kemmis & McTaggart, 1988), were used to guide the development and implementation of a professional development model for teaching Games Centred Approaches (GCAs).

The PD model was implemented over six months and occurred over four phases (needs assessment, design, implementation and assessment). Data were collected using a variety of measures, including focus group interviews, researcher field notes, documentation of materials, lesson observation and reflections. Guided by the action research process, data collection and data analysis were simultaneous. Analysis of data used both an inductive and deductive approach and was ongoing throughout the study.

Significance of the Study

This study provides an opportunity to explore teacher learning and gain an insight into why teacher learning may or may not occur as a result of PD activity, specifically in the context of PE and implementing game-based pedagogy. It presents the opportunity to explore influential elements of PD, identifying potential barriers and facilitators to teacher learning. Although this study is a case study and generalisations from it would have to be made very carefully, the findings are likely to provide useful information, especially to educational policymakers, educational administrators at the state and regional level, particularly curriculum support workers and PD providers, as well as school principals, leaders and teachers. It is hoped that the study will also contribute to the understanding of GCAs and provide information leading to an effective model of PD that supports teacher learning when implementing game-based pedagogy.

This study has both theoretical and practical significance. For teachers, it is a stark reminder of the value of PD to teaching practice; providing insight into ways of identifying and satisfying professional learning needs, assisting teachers to direct their learning process and supporting the belief that teachers need to be in control of, accountable for, and responsible for their professional learning. This study advises teachers of the limitations of PD that promises a 'silver bullet', offering professional learning opportunities that promise to cut through the complexity of teacher learning to provide an immediate solution to transform their practice. For principals and school leaders, this study reinforces the importance of establishing a strong and positive teaching and learning culture within schools, where teachers and leaders are held responsible for their professional practice and professional learning. The findings of this study may also provide strategies for assisting teachers who may experience difficulties in their professional practice and learning.

The study should also assist PD providers and curriculum support workers in informing PD initiatives, ensuring PD opportunities provide coherence to teachers' needs and offer teachers the ongoing support and accountability they need to make and sustain change to their teaching practice. It highlights the importance of PD providers providing opportunities to translate research into practice adequately. From a research perspective, the findings of this study present researchers with a framework for developing informed practice, and a guide to ensure that their research is made accessible to teachers and, most importantly, that their

theory is translated into teaching practice. This study also informs future researchers, advising them to fully explore the reality of what is suggested in their research.

Contribution to the field

This study contributes to the existing body of knowledge by providing recommendations for the provision of PD for educators, specifically in the implementation of GCAs, offering a guide for the delivery of PD in games and sports, PE and more general educational settings. It examines the impact that suggestions relating to improved practices have on facilitating teaching practice in innovative pedagogies and the potential issues with implementing PD programs that meet these needs from a structural and professional perspective. A conceptual framework is presented that joins theories of PLC and CoPs, with effective features of PD to increase teacher knowledge and skills, to change attitudes and beliefs to facilitate change in teacher practice to ultimately improve student learning. The posited conceptual framework provides a guide to developing informed and accomplished practice and poses a range of questions to be considered when determining the suitability, efficacy and value of PD practice.

This study informs those interested in PD about effective elements of PD, along with facilitators and barriers of implementing PD, and those interested in GCAs about the knowledge, skills and understanding needed to implement games-based pedagogy effectively and authentically. Consideration is given to both CoPs and PLCs theories regarding their potential to support teacher learning and transform teaching practice; in doing so, this study questions the efficacy of PLCs to support learning in contexts where a functional PLC cannot be formed. Thereby, this study contributes to the literature by explaining why PLCs may fail and what to do to support or recover PLCs that do not achieve their desired outcomes or fall short in facilitating the desired change to practice or enhance student outcomes for all PLCs members.

Definitions of key terms

Several terms were used during the study and are defined as follows:

Accountability: A responsibility to account for outcomes, practice, performance and explain actions taken.

Communities of Practice: "Groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis" (Wenger, McDermott & Snyder, 2002, p. 4).

Continuing Professional Development (CPD): Ongoing, career-long learning and development related to one's profession or "Professional learning is the formal or informal learning experiences undertaken by teachers and school leaders that improve their individual professional practice, and a school's collective effectiveness, as measured by improved student learning, engagement with learning and wellbeing" (Australian Institute for Teaching & School Leadership [AITSL], 2012, p.2).

Executive: Principal and key experienced staff at a school, occupying formal positions of authority.

Games categories: "the use of a Games Classification System (Bunker & Thorpe, 1982) whereby games are taught according to their similarities of tactical and strategic objectives rather than as a sport in isolation" (Baxter & Dudley, 2007, p.2).

NB: There are **four categories of games**: Target games (e.g. bowling, darts, golf) have the least complex tactical structures. Other games can then be categorised on a continuum of increasing tactical complexity, moving from striking/fielding games (e.g. cricket, baseball), to net/wall games (e.g. tennis, squash), to the most complex invasion games (e.g. football, field hockey).

Game Centred Approaches: The collective/umbrella term used to describe games based pedagogical models such as Teaching Games for Understanding (TGfU; Bunker & Thorpe 1982), Play Practice (PP; Launder 2001), the Tactical Games Model (TGM; Mitchell, Oslin, & Griffin 2006) and Game Sense (GS) (Light 2004) that are aimed at generating a greater

understanding of all aspects of games, while increasing physical activity levels, motivation and enjoyment in PE lessons.

Games Performance Assessment Instrument (GPAI): "a multi-dimensional system designed to measure game performance behaviours that demonstrate tactical understanding, as well as the player's ability to solve tactical problems by selecting and applying appropriate skills (Oslin, Mitchell & Griffin, 1998, P.2).

Principal: The person occupying the formal position of, or acting as, senior manager and administrator of the school.

Professional Development: Professional development refers to the processes, activities and experiences that provide opportunities to extend teacher professional learning. It is also known as Teacher Professional Learning (TPL), Continuing Professional Development (CPD) and Staff Development.

NB: Professional Learning is used to describe **t**he enhanced knowledge and development of new instructional practices as a result of the PD. It refers to the "growth of teacher expertise that leads to improved student learning" (NSW, BOSTES, 2013, P.4).

NB: Teacher Professional Learning is also used in the literature to describe training and development opportunities offered or carried out by teachers**.**

Professional Learning Community (PLC): "educators [creating] an environment that fosters mutual cooperation, emotional support, and personal growth as they work together to achieve what they cannot accomplish along" (Dafour & Eaker, 1998, p. xii).

Public school: A school established by NSW state government, which is largely funded and administered by the government through the NSW state Department of Education and Training (DET).

Teaching and learning Culture: The values and behaviours a person or a group of people have with regards to their own teaching or learning in specific contexts (Sagy, Kali, Tsaushu & Tal, 2016; Sagy, Yotam Hod & Yael Kali, 2019).

Unit of Work: A sequence of lessons that address outcomes based around the topic focus, including assessment that is planned and linked to learning experiences.

Chapter Conclusion

This chapter has introduced the study, providing a brief overview of the research and some background to GCAs and PD. An overview of the research design is provided, along with the research questions. The context of the study is provided outlining the significance and the purpose of this research. The contribution the findings will make to this field of research is also discussed. The chapter concluded by identifying the key terms used throughout the study and providing a definition for these commonly used terms.

Chapter 2

Review of literature

Introduction

The literature review has been composed to review the areas of research that resonate with the study of the professional learning required to support in-service teachers in their implementation of game centred pedagogy.

The literature review is divided into three main sections:

1. Professional Development (PD)
2. Action Research
3. Productive Pedagogies and Game Centred Approaches

The central focus of this study explores teacher Professional Development (PD), this is done within the context of teaching games in Physical Education (PE) using an innovative pedagogical model, namely Game Centred Approaches (GCAs). As such, the first section of the literature review looks at the PD literature and explores the role PD plays in educational reform and improving the quality of education. The literature concerning teacher change is explored, along with an Australian and NSW context of PD. A summary of the work regarding PD within the field of PE and specifically GCAs is also examined. The second section explores the Action Research (AR) literature, making links with PD, where AR as an educational research strategy is examined; literature covering AR in GCAs is also explored. The third section examines quality and productive pedagogies in PE, with a specific focus on GCAs as an innovative and student-centred approach to teaching and learning games in PE. Links are drawn between productive pedagogies, quality teaching and GCAs, with emphasis on the curriculum requirements, particularly the Australian curriculum and the NSW PDHPE syllabus (NESA, 2018). The gap in the literature, which combines all these themes, PD, AR and Productive Pedagogies, specifically GCAs, is identified. The chapter concludes by examining the relevance of the literature to this study, identifying the gaps in the research. The themes identified for the literature review are examined through the relationships identified in Figure 1.

Figure 1. *Literature review organisation and topic relationships.*

Mendeley (Mendeley ltd, 2008), a desktop and web-based reference management application was used to collect and organise the literature into a database. Using Mendeley allowed all relevant literature to be imported into the database, noting the author, title, abstract, publication date and journal, along with any notes made by the researcher when reading the article. Tags were added to each imported article, allowing the researcher to categorise the articles into relevant themes, as illustrated in the literature map (Appendix 2). Tags included Professional Development (PD), Action Research (AR), Games Centred Approaches (GCA), along with Physical Education (PE), PD Characteristics (characteristics), Australian context (AUS) and implementation issues (issues). Tagging the articles allowed the database to be organised and sorted efficiently and effectively, allowing the researcher to filter relevant literature and access the library from any digital device. The notes feature was particularly useful in tracking thoughts and summarising the article within the context of the study. Also, Mendeley allowed articles to be highlighted and notes to be made throughout the flowing text, which was useful in tracking thoughts and insights whilst reading the article. An excerpt from the Mendeley library database (Appendix 1) and literature map (Appendix 2) can also be found in the appendices.

Professional Development

There are many different terms and definitions used to describe teacher Professional Development (PD) in the literature, including in-service teacher education, in-service learning (Hoban & Erickson, 2004), in-service training (INSET) (Bolam, 1999), renewal (Day, 2002), continuing education (Chand, 2000), staff development (Turbill, (1993), teacher professional learning (Attard & Armour, 2006; Timperley, Wilson, Barrar & Fung, 2007), teacher learning (Borko, 2004), professional growth (Clarke & Hollingsworth, 2002), continuing professional development (CPD) (Armour & Yelling, 2007; Atencio, Jess & Dewar, 2012; Makopoulou & Armour, 2011; Pedder, Opfer, McCormick & Storey, 2010), lifelong learning (Brown, 2018) and professional growth (Kostina, 2015; Witterholt, Goedhart, Suhre, van Streun, 2012). Early research by Little (1987) defines teacher PD as "any activity that is intended partly or primarily to prepare paid staff members for improved performance in present or future roles in the school districts" (p. 491). Perhaps these many, wide, and varied terms make it difficult to understand PD's core function and purpose, which may contribute to the difficulties presented in the literature when conceptualising what effective PD is. A more contemporary definition of teacher professional learning is used by AITSL (2012), which considers PD to encompass all "formal or informal learning experiences undertaken by teachers and school leaders that improve their individual professional practice, and a school's collective effectiveness, as measured by improved student learning, engagement with learning and wellbeing" (p.3). This more contemporary definition of 'professional learning' broadens the concept of PD, highlighting the varied range of PD experiences that can support teacher learning and links improved teaching practice to broader educational goals.

In attempting to explain the function of PD, Day and Sachs (2004) describe three imperatives, i) aligning teachers' practice with educational policy, ii) improving students learning outcomes by improving teacher performance and iii) enhancing the status and profile of the teaching profession. Much of the PD literature discusses PD synonymously with educational reform since many reforms rely on teacher learning and improved instruction to increase student learning (see: Borko, 2004; Desimone, 2009; Desimone et al., 2002; Fishman et al., 2003; Garet et al., 2001; Patton et al., 2013). Much of this literature assumes that teachers who know more teach better (Cochran-smith, 1999). Opfer & Pedder (2011) argue that this 'process–product conceptualization of causality' linking effective PD,

improved teacher instructional practices and improved student learning, is the impetus for a large amount of attention given to teacher PD by researchers and policymakers. High-quality professional development is viewed as a central component in most modern proposals for improving education (Guskey, 2002). Desimone et al. (2002) suggest that "professional development could be a cornerstone of systemic reform efforts designed to increase teachers' capacity to teach to high standards" (p.81). Whilst Patton, Parker, and Tannehill (2015) suggest PD should be viewed as both an obligation and opportunity for teachers, providing a 'forum for change' and confirmations of their current teaching practice.

In their overview of teacher professional development in an Australian context, Grundy and Robinson (in Day and Sachs, 2004) identify three interconnected purposes of continuous PD, which include

i) extension, introducing new knowledge into a teacher's repertoire through educational innovation;
ii) growth through the development of greater skill and expertise; and
iii) renewal through the transformation and change of knowledge and practice.

(Grundy & Robinson, p.149)

In exploring the purpose of PD to improve teacher knowledge, Cochran-smith and Lytle (1999) distinguish between three prominent conceptions of knowledge associated with teacher learning and development; 'knowledge-for-practice' referred to as 'formal knowledge and theory' generated by researchers outside the school setting, for teachers to use in order to improve practice; 'knowledge-in-practice', this refers to the practical knowledge embedded in teachers practice and their reflections on practice, 'knowledge-of-practice' when teachers treat their own classrooms and schools as sites for intentional investigation at the same time that they treat the knowledge and theory produced by others as generative material for interrogation and interpretation. Later, Day and Sachs (2004) added a fourth element, 'knowledge of self', where learning is generated by teachers engaging in reflection in, on and about their values, purposes, emotions, and relationships.

The professional development literature forges a connection between effective teaching and student achievement, highlighting teacher quality as a critical factor in student achievement (Wenglinsky 2000; Darling-Hammond, 2000). The research affirms that engaging teachers in high-quality professional learning is the most successful way to improve teacher effectiveness (Greenwald, Hedges & Laine 1995; Guskey & Huberman 1995; Elmore &

Burney 1997; Hawley & Valli 1999; Elmore 2002). To be effective, teachers need a deep understanding of their subject area and how to teach subject content, knowing how students learn specific subject matter and a range of strategies and practices that support student learning (AITSL, 2011). Much of the literature identifies the benefits of student-centred pedagogies, where students are active participants in their learning (Dix, 2012). Game Centred Approaches (GCAs)-due to their learner-centred, inquiry-based pedagogy (see Butler, 2005; Fry, Tan, McNeill, & Wright, 2010; Hopper, Butler & Story, 2009)-provide an ideal means for teachers to increase student learning and engagement; providing students inclusive, enjoyable, and effective learning experiences to play sport and games (Light 2002; Mitchell, 2005).

Despite the apparent link forged in the literature between teacher professional development and improved student learning, several studies have reported the difficulties in translating PD into student achievement gains (see: Guskey & Yoon, 2009; Opfer & Pedder, 2011; Yoon, Duncan, Lee, Scarloss & Shapely, 2007). Desimone et al. (2002) and Desimone (2009) suggests there is little direct evidence of the extent to which these characteristics are related to better teaching and increased student achievement. This research signals the need for more work linking PD and changes in teaching practice to student achievement. Moreover, despite the seeming 'professional consensus' (Desimone, 2009; Desimone et al., 2002) on the characteristics of PD that lead to teacher learning and change, Opfer and Pedder (2011) argue, we are still unable to predict teacher learning based on these characteristics. Furthermore, the literature reveals that teachers are often provided with little opportunity and support for professional development in teaching environments (Darling-Hammond & McLaughlin, 2011) and that fewer resources are being allocated to support teacher learning (Day & Sachs, 2004). As such, questions remain about the impact of professional development programs on teacher beliefs and practices (Garet et al., 2001b).

PD practices have been dominated by individualistic, short-term and de-contextualised activities, often in response to bureaucratic or administrative fiat (Day & Sachs, 2004). Typical or traditional forms of PD provision are characterised by one-off, off-school site (Casey, 2012a), one-day courses or workshops (Garet, Porter, Desimone, Birman, & Suk Yoon, 2001), with one-size-fits-all solutions (Guba, 1996) and a top-down approach to disseminating knowledge (Lauscher & Jarvis-Selinger & Beckingham, 2004); where teachers are provided with information and resources that they are expected to translate into action

(Butler, Gersten, Vaughn, Deshler, & Schiller, 1997; Keay 2006). This PD model identifies with the 'deficit model' identified by Philip Jackson (1968), which assumes that teachers need to be provided with something they are deficient in or do not already have. These dominant approaches to PD have been described as 'woefully inadequate' (Borko, 2004, p. 4) and 'deficient' (Fishman et al., 2003, p.643), with much of the literature deeming them ineffective in supporting teachers to learn in ways that can enhance practice (Armour & Yelling, 2007, Butler, Lauscher, Jarvis-Selinger, & Beckingham, 2004, Garet et al., 2001; Hanushek, 2005; Knight, 2002; Sykes, 1996). Sykes (1996) identifies these conventional professional development practices as the most serious unsolved problem for policy and practice in American education today.

The literature has called for substantive pedagogical change and a reconceptualisation of how we view and engage in professional learning (Casey, 2012; Opfer & Pedder, 2011; Patton et al., 2015). Opfer and Pedder (2011) suggest a more complex conceptualisation of professional learning is required, one that looks at the ways the elements of three subsystems, the teacher, the school, and the learning activity, interact and combine in different ways and with varying intensities to influence teacher learning. Moreover, Pedder, Opfer, McCormick, and Storey (2010) indicate that the focus of professional learning needs to be about the assimilation of knowledge. Notably, there has been a shift in the PD discourse over the past 20 years, to one which values lifelong learning and more collaborative and cooperative forms of PD that create 'professional capital' (Hargreaves & Fullan, 2012), encouraging continuous teacher development and providing a comprehensive set of actions to help teachers learn and move forward.

Professional development (PD) opportunities, often in the form of Professional Learning Communities (PLCs) and Communities of Practice (CoP), are an example of this shift. It is argued that these PLCs have the potential to engage teachers in the development of a collective culture allowing them to learn from and with each other and to struggle with the uncertainties that accompany their roles as learners and as teachers (Darling-Hammond & McLaughlin, 2011, Patton et al., 2013). Likewise, the CoP literature suggests CoPs develops a shared practice as members engage in a collective process of learning (O'Sullivan, 2007). CoP theory believes teachers learn when they "generate local knowledge of practice by working within the contexts of inquiry communities to theorize and construct their work and to connect it to larger social, cultural, and political issues" (Cochran-Smith & Lytle, 1999, p.

250). These collaborative and cooperative forms of PD, such as PLCs and CoPs, align better with what Day and Sachs (2004) title the 'aspirational model' of PD. In doing so, this form of PD acknowledges that teachers who are already effective can continue to improve and contribute to learning communities in schools.

Much of the research around Professional Learning Communities (PLC) and Communities of Practice (CoP) contributes to this growing body of research that calls for improvements to the quality and design of teachers' career-long professional development (Borko, 2004; Fishman, Marx, Best, & Tal, 2003; Kostina, 2015; Makopoulou & Armour, 2011) and the quality of inquiry into teacher learning (Desimone, 2009). In their research, Fishman et al., (2003) highlight the importance of in-service teachers to engage in continuous professional development (CPD), since a year-on-year update of innovations in educational practice and assimilation of new knowledge, skills and expertise is likely to enhance the quality of students' learning. In their extensive work within the teacher professional development in a PE context, Armour and her colleges (see: Armour & Makopoulou, 2012; Armour & Yelling, 2004, 2004b, 2007; Makopoulou & Armour, 2011, 2011b), recognise the importance of teachers being 'lifelong learners', engaging in continuous and effective professional learning throughout their careers. In support of this, Casey (2012) argues for prolonged professional development that engages teachers in learning communities. Similarly, Crockett (2002) highlights the need to focus attention on "creating local communities that promote the practice of shared inquiry grounded in teachers' work" (p.609). Teachers need to be provided with opportunities to reflect critically on their practice and to fashion new knowledge and beliefs about content, pedagogy, and learners (Nelson & Hammerman 1996; Prawat, 1992).

The research advocates collaborative, site-based, inquiry-based approaches, suggesting they offer a promising and appealing alternative to conventional professional development programs (Ermeling, 2010; Garet et al., 2001). Crockett (2002) in discussing her year-long work with a teacher inquiry group in Mathematics, commented that "recent recommendations for professional development focus attention on creating local communities that promote the practice of shared inquiry grounded in teachers' work" (p. 609). However, she notes that little is known about the content of these structures. Casey's (2012) later work on continued professional development (CPD) advocates that, through using inquiry and research, teachers can "focus their learning on 'their kids' and 'their problems' rather than engage in off-site approaches which assume that 'one size fits all'" (p.76). Linking inquiry models of PD to

CoPs and PLCs, Ermeling (2010, 2012) notes a simultaneous increase over the last 20 years in both the interest in practice-based communities of professional inquiry or 'communities of practice' and the criticism of conventional professional development programs. He identifies 'communities of inquiry' as a "central feature of high quality teacher professional development" (p.377). He suggests communities of inquiry take on a variety of names and forms, such as action research (Carr & Kemmis, 1986), teacher research (Cochran-Smith & Lytle, 1993), Japanese lesson study (Fernandez, Cannon, & Chokshi, 2003; Lewis, Perry, & Murata, 2006; Stigler & Hiebert, 1999), inquiry groups (Crockett, 2002), and learning teams (Gallimore, Ermeling, Saunders, & Goldenberg, 2009).

The inquiry model requires teachers to identify an area of instructional interest, collect data, and make changes in their instruction based on an interpretation of those data. Little (1993) believes that such approaches afford critical reflection, engaging teachers in the "pursuit of genuine questions, problems, and curiosities, over time, in ways that leave a mark on perspectives, policy, and practices" (p. 6). The origins of professional development through inquiry can be traced back to the work of Dewey (1910, 1933). He viewed inquiry as a process of progressive problem solving and believed that nurturing reflective dispositions was an essential ingredient for improving pedagogy over time (Rodgers, 2002). Later, Schön (1983, 1987, 1991) built on Dewey's work, further developing the concept of inquiry and reflective practice by focusing on how individuals think both during and after their actions. One of the essential features of the inquiry model as professional development practice is that research should be part of teachers' development. Stenhouse (1985) argues that scientific inquiry aims to democratise educational research by actively including teachers in the inquiry process. As such, action research sits under the umbrella term of inquiry-based professional development. Examination of the action research literature reveals that its goals, like those of the inquiry model, are related to change and improvement (Carr & Kemmis, 1986; Elliott, 1991; Whitehead, 1989). Ermeling (2012) suggests that the emphasis of action research can range from more general school problems and educational issues to the more explicit emphasis on the study and improvement of instruction. Action research as an educational research strategy and a professional development model will be discussed below and links drawn between PE and GCA research.

Teacher Change

Historically, teacher change has been directly linked with planned Professional Development (PD) activities (Clarke & Hollingsworth, 1994). Most PD activities are designed to initiate and facilitate change in teachers' attitudes, beliefs, and perceptions, where this change process will lead to specific changes in their classroom behaviours and practices, which in turn will result in improved student learning (Guskey, 2002). Teacher change needs to be durable and sustained, and PD initiatives need to ensure they are designed with this in mind. However, many professional development programs fail to consider "what motivates teachers to engage in the staff development process and the process by which change in teachers typically takes place" (Guskey, 2002, p.6).

Models of teacher change

Informed by the work of early change theorist Lewin (1935), Guskey (1986) proposed a model that re-examines the process of teacher change in order to guide the creation of more effective professional development programs. The model of teacher change proposed by Guskey (1986) considers the major goals of PD which are to bring about change in the classroom practices of teachers, change in their attitudes and beliefs, and change in the learning outcomes of students. Guskey (see Guskey, 1986, 2000, 2002) argues that the order in which these outcomes occur is significant in considering the effectiveness of change processes in achieving the desired change and the endurance of that change. In Guskey's (1986) alternative model of teacher change, a significant change in teachers' attitudes and beliefs occur after they gain evidence of improvements in student learning. These improvements typically result from changes teachers have made in their classroom practices. The findings of Guskey's (2002) work highlight that teacher change is both a gradual and difficult process for teachers, where teachers need to receive regular feedback on their students' learning progress and continued follow-up, support and pressure needs to be provided.

Guskey's work into teacher change has been criticised for its oversimplification and linear conceptualisation of the complex change process, suggesting the process of teacher change is more cyclical than linear, with multiple entries (Clarke, 1988; Clarke & Peter, 1993). Retaining Guskey's process of teacher change, Clarke (1988) suggests the model should be viewed as a cyclical process with multiple entry points. Similarly, Mouza (2006, 2009)

supports this cyclical process of teacher change in her longitudinal research of teacher learning in technology integration, whereby changes in practice influenced changes in beliefs and vice versa. Mouza (2006, 2009) proposes spiral cycles of teacher change, modelled after the spiral of action research cycles, indicating the continual growth trajectory. The upward direction of the spiral is used to signify the continual growth of participants. In further conceptualisation of the teacher change process, Cobb, Wood, and Yackel (1990) proposed the importance of creating "cognitive conflict" in teachers' minds, where teachers' approaches are challenged prior to them attempting to modify their classroom practice. Informed by the work of Guskey (1986, 2000, 2002) and Clarke and Peter (1993), Clarke and Hollingsworth (2002) proposed a more complex, interconnected model of professional growth. In their interconnected model, change occurs through the mediating processes of 'reflection' and 'enactment', in four distinct domains which encompass the teacher's world:

1. the personal domain (teacher knowledge, beliefs and attitudes),
2. the domain of practice (professional experimentation),
3. the domain of consequence (salient outcomes), and
4. the external domain (sources of information, stimulus or support).

Fullan's (1992) research criticised change initiatives for viewing teachers and schools as 'objects for PD' rather than 'receivers of PD', highlighting the importance of teachers being part of the change process. In Fullan's (1992) work on implementing successful school improvement, he identified four key elements needed to impact the change process at the school level:

1. There needed to be active initiation and participation by all teachers.
2. There needed to be pressure and support for change at the local level.
3. There had to be changes in teachers' behaviours and beliefs regarding the change.
4. Teachers needed to feel the ownership of change.

(Fullan, 1992, p. 25)

Fullan (1994) opposes top-down approaches for learning often displayed in schools, suggesting teachers need to be involved in the learning process and the development of the school's vision. Fullan's (2007) later work synthesises the lessons learned from decades of school-centred reform efforts, advocating for collaborative cultures at the school level, proposing Professional Learning Communities as effective mechanisms to support and

facilitate change. This research on teacher change helps inform effective models of professional development.

Factors influencing teacher change

In an attempt to understand how these models, promote positive change and understand why change may or may not be promoted; it is necessary to understand the nature of barriers to and facilitators of the change process. In this regard, the PD literature identifies many factors that appear to influence teacher change. Barriers to professional learning identified in a school context include those related to structural and management changes (Duncombe & Armour, 2004), the importance of supportive workplace culture (Keay 2006), and influences from a local educational administration (Parker, Patton, Madden & Sinclair, 2010), along with a range of emotional responses to change (Saunders, 2014). Other research shows facilitators of learning by providing quality activities, tasks, resources (McDonough, Clarkson & Scott, 2010; Cameron, Mercier & Doolittle, 2016). Whilst more recently, Forrest, Lowe, Potts and Poyser (2019) reinforce collaboration, reflection and knowledge of outcomes as factors facilitating teacher practice change.

Specifically, in the context of Physical Education, Rovegno and Bandhauer (1997) outline five dispositions that can be essential aspects of teacher thinking and can help to explain successful knowledge development and teacher change. These include,

I. the disposition to understand the approach accurately and deeply and to do the job right,
II. the disposition to accept that the approach was difficult to learn and to persist in seeking clarification,
III. the disposition to justify and develop a practice in keeping with a sound educational philosophy theoretical foundations,
IV. the disposition toward change and to learn and implement new ideas, and
V. the disposition to suspend judgement of new ideas.

(Rovegno & Bandhauer, 1997)

Bechtel and O'Sullivan (2006) suggested that to help design more effective PD programs for secondary PE teachers, we need a better understanding of the teacher change process. Later, Bechtel and O'Sullivan (2007) identified the common enhancers and inhibitors for the

teachers' change process. Enhancing factors included visions and beliefs of physical education and support from principals, colleagues, and students. Whilst district practices and policies and educational priorities were identified as inhibitors to change. Lack of professional development provision for physical educators was perceived as a key barrier to teacher change.

Patton and Griffin (2005) explored the experiences and patterns of change in a Teacher Development project on an Assessment Initiative for Middle School Physical Education. Their findings highlight the link between beliefs, values and practice. The teachers in Patton and Griffin's (2005) study made changes to their PE programs that resulted in a transformation of the values and beliefs that guided their practice. In order to foster change to teaching practice, Patton and Griffin (2005) advocate a flexible approach to PD, with a dual focus on practices and beliefs. However, they recognise that change involves risk-taking and recognise the importance of gaining a better understanding of the duration and types of support that makes a difference for teachers, suggesting with the intensity, multiple resources, and ongoing support necessary to achieve substantive changes.

Exploring curriculum change in PE, Maclean, Mulholland, Gray and Horrell (2015) suggest that the combined factors of teacher agency, culture and social and material structures along with the school's capacity to manage new policy development, are crucial in enabling teachers to enact and sustain change. They highlight the importance of understanding teachers' perception of the reasons for change and whether teachers understand why change is made and acknowledge that many teachers need to change their mindset and 'broaden their horizon' about teaching PE. Similar to Priestly (2010), Maclean et al., (2015) identified the vital role of teacher agency as a crucial factor in encouraging change. The importance of collaboration throughout the school was highlighted along with school structures that promoted links to Professional Learning Communities (PLC) and interdisciplinary interaction.

In their longitudinal work, examining teacher-initiated changes in a high school physical education program, Cameron, Mercier, and Doolittle (2016) highlight several factors instrumental in the change process. Their results found that the quality of the innovation, the resource, in their case, the assessment package provided, and access to learning about the assessment package through the supporting materials, along with the teacher workshops,

were all facilitators in the initiation phase of the change process. Also, findings showed that teacher advocacy was an essential factor in supporting change, where confidence, passion and a shared commitment to program improvements among the physical education teachers were instrumental in the change process.

In more current research exploring teacher change in PE, Kern and Graber (2017, 2018) suggest teachers' dispositions can act as either a barrier to or facilitator of change. They examine PE teachers' dispositions toward making pedagogical changes to their programs using a 15-item teacher change questionnaire they developed and validated. Their results indicated that teachers regularly make self or co-initiated change to their teaching programs, including changes to instructional strategies, management strategies, assessments, and the learning environment. Changes to assessment were the least changed elements and, large-scale curricular changes were not initiated. The findings showed low involvement in pedagogical changes from the Principal. External initiatives were identified as the primary initiator of change. In examining the dispositions for change, Kern and Graber (2018) suggest that men and women experience change differently. Their findings also show that teachers who teach other subject areas in addition to PE are more likely to make pedagogical changes to their practice, whilst more experienced teachers were less likely to make changes to their teaching practice. Kern and Graber (2018) suggest that the closer individual teachers are to retirement, the less likely they are to invest in change initiatives.

Of particular significance to this study, Yoon and Armour (2017) examine teacher professional learning and impacts on student learning in a Community of Practice (CoP) in South Korea. Their findings provide clear evidence of teacher learning within the CoP, supported with pedagogical and instructional changes to teaching practice. Yoon and Armour (2017) identify a range of barriers, including the pupils' negative perspectives to the change initiative and contextual barriers such as lack of cooperation and difficulties with navigating co-workers' preferences in teaching. Educational and cultural barriers were also evident, impacting on the teacher change and pedagogical practice.

In essence, there has been much research focused on teacher change in PE, highlighting the clear connection between teacher beliefs and values, and change to pedagogical practice. The school environment plays a key role in addressing the structural, administrative and management conditions to support learning. Understanding the barriers of and facilitators to

learning helps inform change initiatives and guide PD opportunities to support and facilitate change to practice. These barriers and enhancers of pedagogical change help identify the key characteristics of effective professional development that are explored below.

Characteristics of Effective Professional Development

The PD literature reveals a great deal about what constitutes effective professional development (see: Birman, Desimone, Porter, Garet, 2000; Guskey, 2003; Guskey & Yoon, 2009; Hunzicker, 2011; Knight, 2002). Desimone (2009) argues, "understanding what makes professional development effective is critical to understanding the success or failure of many education reforms (p.181). Effective PD may be characterised by teacher development and improved practice, the impact it has on pupil learning, or even the capacity it has to engage teachers (Patton, Parker, Tannehill, 2015). Darling-Hammond and McLaughlin (2011) suggest, "effective professional development involves teachers both as learners and as teachers and allows them to struggle with the uncertainties that accompany each role" (p.82).

There is a growing consensus within the literature that identifies the features and characteristics of effective PD for teachers, and the types of PD that are likely to enhance teacher and pupil learning (see: Armour & Yelling, 2007; Birman, Desimone, Porter & Garet, 2000; Desimone, 2009; Guskey, 1995, 2003b; Guskey & Yoon, 2009; Knight, 2002; Sparks, 2002; Timperley et al., 2007). Early work by Sparks and Loucks-Horsley (1989) examining models of staff development presents a summary of the characteristics of effective staff development, including;

- Programs conducted in school settings and linked to 'schoolwide' efforts;
- Teachers participating as helpers to each other and as planners, with administrators, of in-service activities;
- Emphasis on self-instruction, with differentiated training opportunities;
- Teachers in active roles, choosing goals and activities for themselves;
- Emphasis on demonstration, supervised trials, and feedback; training that is concrete and ongoing over time; and
- Ongoing assistance and support available on request

(Sparks & Loucks-Horsley, 1989).

In later research, Timperley et al. (2007) synthesised the findings of 97 international studies

to produce their 'best evidence synthesis iteration of teacher professional learning and development'. Their key findings distinguished some characteristics of effective professional learning that had a substantial influence on student outcomes. Timperley et al's (2007) synthesis showed the importance of engaging teachers as learners, focusing on new knowledge underpinned by theoretical concepts that relate to practice. The meanings and implications of which need to be discussed and explored with other teachers. Later, Desimone (2009) established a core conceptual framework for effective PD, identifying a set of critical features that define effective professional development. Desimone (2009) suggests these features are "critical to increasing teacher knowledge and skills and improving their practice, and which hold a promise for increasing students' achievement" (p.183). These features include a focus on content, active learning, coherence, duration and collective participation.

In a PE context, Armour and her colleagues focussed on the continuing professional development of PE teachers (see: Armour & Makopoulou, 2012; Armour, Makopoulou, & Chambers, 2012; Armour &Yelling, 2004, 2004b, 2007; Makopoulou & Armour, 2011a, 2011b) identifying key characteristics of PD for application within a PE context. Armour and Yelling (2004) reported that teachers defined effective PD as practical, relevant and applicable; able to provide useable ideas; delivered by a good presenter who understands the real world of teaching; challenging and thought-provoking, and offering time for reflection and collaboration. Many parallels can be drawn from the work of Armour and her colleagues in a PE context to the broader PD literature.

The following eight characteristics draw on the consensus of characteristics of effective PD presented in this research. They are presented here as being critical features of teacher PD:

1. Knowledge building
2. Active learning
3. Coherence
4. Situated
5. Continuous ongoing support
6. Collaborative practice
7. Capacity building
8. Reflective practice

Knowledge Building (Content focus)

Desimone (2009) states, "The content focus of teacher learning may be the most influential feature [of PD]" (p.184). She makes the link between PD activities that focus on subject matter content and how students learn that content, indicating that the subject matter content that is chosen, strongly influences the level of learning a teacher experiences while engaged in PD. Desimone (2009) suggests that effective PD, as governed by this core conceptual framework, has the capacity to increase teachers' knowledge and skills and changes their attitudes and beliefs, change teachers' instructional practice and as a result, foster increased student learning.

Similarly, Corcoran (1995) suggests, professional development that focuses on subject matter content and how children learn it may be an important element in changing teaching practice. Moreover, Garet et al., (2001) report a focus on content knowledge to be a core feature of professional development activities in their comparison study of the effects of different characteristics of professional development on Mathematics and Science teachers' learning. Desimone (2009) suggests that more research is required into which aspects of teacher knowledge are critical and how to measure them, increasing our understanding of how teacher knowledge enables practice.

The need for PD to focus on subject matter content and how students learn that content is also evident in the PE literature. In their work with Primary teachers in a PE context, Coulter and Woods (2012) suggest PE-PD should focus on depth of content and pedagogical content knowledge rather than breadth. In their case study of an in-service elementary physical education teacher who made a large-scale change from an 'activities-based approach' to a 'movement-based approach', Rovegno and Bandhauer (1997) show that possessing appropriate content knowledge is essential in implementing and supporting change adequately.

Like the concerns echoed in the wider PD literature, research in the PE PD field highlights the difficulties associated with developing teacher knowledge and the problems associated with current forms of PD when focusing on building teacher knowledge. In exploring the feelings of teachers towards CPD, Casey (2012) reflects the concerns of broader PD literature criticising current 'homogenous' approaches to CPD that are used to 'deliver' packages of standardised knowledge'. He suggests, if governments view teachers' knowledge as a series

of discrete, interchangeable skills then this form of CPD will continue to dominate. Bechtel and O'Sullivan (2006) suggest that one of the challenges associated with providing quality PE PD is ensuring that teachers' knowledge of the subject matter of teaching and learning, and their students is shared and valued. Armour, Makopoulou, and Chambers (2012) note the teachers' concerns from three different countries regarding their inability to make progress in their learning, highlighting the subject knowledge barriers within PE PD, where teachers are unable to deepen their knowledge within specific areas of knowledge and interest.

Active learning

Consistent with constructivist perspectives on learning, it was understood that learning was dynamic and involved the active construction of knowledge. Professional development activities where teachers are given the opportunity to actively engage in their professional learning is also related to effective PD (Desimone, 2009; Garet et al., 2001). Garet et al. (2001) outline opportunities for active learning, such as the opportunity to observe expert teachers and to be observed teaching; to plan how new curriculum materials and new teaching methods will be used in the classroom; to review student work in the topic areas being covered, and to lead discussions and engage in written work. Similarly Birman, Desimone, Porter and Garet (2000) state, "By engaging teachers in active work, and by fostering a coherent set of learning experiences, a PD activity is likely to enhance the knowledge and skills of participating teachers" (p. 29). Whilst, O'Sullivan and Deglau (2006) argue, "teachers should be treated as 'active learners' who construct their own meanings and understandings from active participation in the PD program rather than acting as passive recipients of ideas and curricula. Arranging for teachers to play a more central role in designing and implementing initiatives for their own learning will encourage active participation" (p. 446). As with Desimone (2009), Armour and Yelling (2004) identify 'active learning' as being a core component of effective PE PD. Armour and Yelling (2004) contest that if PD is to be effective for physical educators, it needs to be practical and 'hands-on', allowing teachers the opportunity to engage practically in the activity.

Sparks and Loucks-Horsley's (1989) summary of effective PD practices makes links to effective learning, suggesting that teachers should take active roles, choosing goals and activities for themselves. Similarly, Timperley et al. (2007) synthesis showed that it is vital for teachers to engage as learners. The idea of teachers as active, innovative learners,

focusing on making relevant links with other learning contexts and on how their students learn, is an essential dimension of successful PD (Attencio, Jess, & Dewar, 2012; Deglau, Ward, O'Sullivan, & Bush, 2006). This notion of teachers as active learners is consistent with the concept of AR and 'teaching as inquiry' involving teachers in cyclic processes that pose questions about the impact of teaching on student learning (MOE, 2007). The assumption underpinning this research project was that as teachers developed a better understanding of the core concept of critical evaluation, they, in turn, would be better able to help their Scholarship students achieve better outcomes. AR or insider research methodologies have been used in many educational settings (see Kemmis & McTaggart, 1988), including PE (see Tinning, Macdonald, Tregenza, & Boustead, 1996).

Coherence

In line with Sparks and Loucks-Horsley (1989) guidelines that link PD to wider school efforts, Desimone (2009) identifies coherence as another core feature of professional development, defining coherence as "the extent to which teacher learning is consistent with teachers' knowledge and beliefs" (P.184). This notion of coherence was previously highlighted by Garet et al., (2001) who state that PD activities can promote coherence by "incorporating experiences that are consistent with teachers' goals and aligned with state standards and assessments, and by encouraging continuing professional communication among teachers" (p.918). The notion of 'coherence' is also identified in Armour and Yelling's (2004, 2007) work, where they identify that effective CPD needs to be 'relevant' and 'applicable' to the teachers setting and context and aligned to teachers' goals and needs. They also state that PE teachers value PD opportunities that are challenging and thought-provoking and provide them with 'ideas' and 'practices' that they can use (Armour & Yelling, 2004). Similarly, in a PE context, Coulter and Woods (2012) recommend that PE-PD should be individualised to each learner's needs and engage learners with the key skills and processes, ways of thinking and practising relative to the content being mediated.

Situated

The PD literature shows that effective professional development for teachers does not occur in 'bite-sized de-contextualized in-service workshops' (Rangeon, Gilbert, & Bruner, 2012), conducted off-site (Casey, 2012; Garet, Porter, Desimone, & Birman, 2001a) or externally run 'courses' (Armour & Yelling, 2004b; Keay, 2005). Garet and his colleagues (2001a)

suggest that off-site PD activities do not provide the same opportunities for integrating new learning as 'reform' activities that are integrated into practice. Consistent with situated learning theories, the PD research shows that learning takes place in multiple contexts and situations, where PD providers need to analyse individual learning contexts and their synchronicity for teacher learning. (Armour, Makopoulou & Chambers 2008).

Similarly, O'Sullivan and Deglau 2006 suggest, PD must be situated in classroom practice, not abstract theorising about ideal environments and goals for physical education teaching and teachers. Armour, Makopoulou and Chambers (2008) suggest, understanding the situated nature of learning can support teachers to link theory and practice in their contexts, engage in supported critical reflection and grow theories that can be shared with peers. Timperley et al., (2007) reinforce the complex nature of teaching and learning, stating "sense-making is a complex process involving interaction between an individual's existing cognitive structures (knowledge, beliefs, and attitudes), the situation in which they practise, and the providers' messages" (p.197). Thus, the challenge for PD providers is to present PD opportunities that take into consideration the interplay of these influences and connect to teachers, presenting information in ways that make sense to the teachers they expect to influence.

Continuous ongoing support

Much of the PD literature indicates that teacher change is a lengthy and ongoing process (Guskey, 2002; Bechtel & O'Sullivan, 2007; Day, 2004). Whilst little is known about the optimal duration of PD activities (Coulter & Woods, 2012; Cordingley, Bell, Thomason & Firth, 2005; Desimone, 2009; Villegas-Reimers, 2003), Desimone (2009) alludes to a 'tipping point' of 20 hours or activities that are spread over a semester. Garet et al., (2001) identify that the duration of PD is important, since teachers need time for in-depth discussions of content, student conceptions and misconceptions, and pedagogical strategies, to try out new practices in the classroom and get feedback on their teaching practice. Desimone (2009) calls for further research into the thresholds for these features of high-quality PD.

In their early synthesis of effective PD practice, Sparks and Loucks-Horsley (1989) highlighted the need for ongoing assistance and support available on request and training that is concrete and ongoing over time. It is acknowledged that teachers need to be 'lifelong learners', 'continuously learning' and engage in continuous and effective professional learning throughout all stages of their careers (Day, 2002; Desimone, 2009; Patton et al.,

2013). This notion of career-long, continuous PD is identified as a defining characteristic of all professions. Improving the quality of teachers' career-long professional learning is pivotal to raising the standards of physical education (Armour & Yelling 2004). Professional development should be continuous and ongoing, involving follow- up and support, and training over extended periods for further learning (Armour & Yelling, 2004; Rangeon et al., 2012), where PLCs provide a promising context for teachers' continuous professional development (Vanblaere & Devos, 2016).

Collective participation

Teacher collaboration is regarded as a powerful tool for teacher professional development and school improvement. This research draws parallels and echoes that of the CoPs and PLC research. PD activities that allow for collective participation by allowing teacher interaction and discourse are viewed as critical features for teacher learning (Borko, 2004; Desimone, 2009; Desimone et al., 2002; Sjoer & Meirink, 2016). Researchers acknowledging the need for collaborative participation in teacher PD have called for a shift in the way we think about PD, moving away from an emphasis on individuals and courses to systemic, complex understandings of how learning is created and shared within communities of practice, advocating for a collaborative culture of teamwork, empowerment and student learning that transforms teaching (Guskey, 1995; Knight, 2002; Patton & Parker, 2012). This shift in thinking about the collaborative nature of PD aligns with the growing body of research that explores teacher learning and PD using CoPs (Barab & Duffy, 2000; Hodkinson & Hodkinson, 2003; Lave & Wenger, 1991; Little, 1990; Wenger, 1998) and PLCs as a means of growing professional practice (Bolam, McMahon, Stoll, Thomas, & Wallace, 2005; Darling-Hammond & McLaughlin, 2011; Patton, Parker, & Pratt, 2013).

Echoing the research in the wider PD literature, research in a Physical Education PD context, reinforces this notion of collaboration and reflection, advocating that teachers need to be given the opportunity to exchange knowledge and experience, sharing ideas and practices with fellow professionals (Armour & Yelling, 2004). Armour and Yelling (2007) argue, "Where teachers are able to learn together in a supportive context, effective professional learning is facilitated (p. 180). Similarly, Coulter and Woods (2015) recommend that PE-PD programs should encourage and facilitate opportunities for teachers to get together during the school day to prompt communication and collaboration and to foster a community of

learning.

Specifically, in the GCAs context, the work of Nash (2009) supports the notion that collaboration and collective participation are critical features for teacher learning. Nash's (2009) study explored the use of 'communities of practice' (CoPs) when teaching TGfU to pre-service teachers. The social learning experience provided by the CoP assisted in developing a deeper sense of how to implement TGfU effectively in their pedagogy. Similarly, the work of Wright, McNeill and Fry (2009), looking at student teachers learning to teach games through a tactical approach, also makes links to learning within CoPs. Their findings suggest that learning took place through 'legitimate peripheral participation' (Lave & Wenger, 1991) in communities of practice' and this facilitated pupil movement through the 'zone of proximal development'.

Capacity building

Capacity is identified as a "complex blend of motivation, skill, positive learning, organisational conditions and culture, and infrastructure of support", empowering and involving individuals, groups, whole school communities and school systems to sustain learning over time (Stoll et al., 2006, p.221). Findings from Armour and Makopoulou (2011) show that one of the most important goals for PE-CPD is to support teachers to "develop the ability and the desire to learn throughout their career" (p. 586); what Claxton (2002, cited in Armour and Makopoulou, 2011) refers to as building teachers 'learning capacity'. Similarly, Tripp (2004) points out that 'transforming' teachers from passive to active, independent learners is challenging and requires a lot of 'capacity building' work. Armour and Makopoulou (2011) argue that PE-CPD needs to be 'systematic, meaningful, personalised, and career-long, if it is to develop teachers' ability and desire to learn throughout their career. Similarly, Patton, Parker and Pratt (2013), in their study of the pedagogy of facilitation within PE PD suggest, "The ethos is of teacher capacity building where teachers view themselves as learners finding their own voice" (p. 442). Stoll et al. (2006) suggest Professional Learning Communities (PLCs) provide considerable promise for building teacher capacity and sustaining teacher improvement.

Reflective practice

The importance of reflective practice is extolled in the PD literature (Armour et al., 2012;

Brown, 2011; Keay, 2005; Loughran, 2002, 2006, 2007). Loughran (2002) suggests that reflective practice "is seductive in nature because it rings true for most people as something useful and informing" (p. 33). Tinning, MacDonald, Wright, and Hickey (2001) relate reflective practice to an individual's learning and highlight its capacity in promotive active learning. Armour et al. (2012) argue that PE teachers' reflective practice is vital for their professional learning. However, Keay (2005) argues that while a reflective approach to learning is needed, it needs to be a critical reflection.

Similarly, Attard and Armour (2006) highlight the importance of critical reflection as part of teachers' professional development, showing that critical reflection can promote professional learning and facilitate change to teaching practice. Highlighting the collaborative nature of learning, Loughran (2006) advises that reflective practise must be more than just a personal journey. Whilst Brown (2011) urges that reflective practice needs to be done in an informed way. Gubacs-Collins (2007) highlighted the importance of self-reflection, in her study using action research on implementing a tactical approach to teaching tennis in a pre-service teacher education setting.

Professional Development: An Australian and NSW context

Since the introduction of the Australian Institute for Teaching and School Leadership (AITSL) teaching standards (the Standards) (AITSL, 2011), teachers have been made more accountable for their professional learning. The Standards make explicit the elements of high-quality teaching that will improve educational outcomes for students (AITSL, 2011). The Standards recognise the importance of improving teaching practice as a means of improving outcomes for students, acknowledging that this focus needs to infuse any approach to teacher development (AITSL, 2011). Professional engagement is featured as a key element of quality teaching in The Standards. Teachers are required to model effective learning by identifying their own learning needs and analyse, evaluate and expand their professional learning, both collegially and individually (AITSL, 2011).

From January 2018, all teachers will need to be accredited to continue, return to, or start teaching in an NSW school. This will be regulated by the NSW Education Standards Authority (NESA). As such, all teachers will be required to provide evidence of practice against The Standards for registration at the proficient career stage (NESA, 2019). Teachers

will be held accountable for their engagement in their professional learning; they will be required to show how they have improved their teaching practice and how they have applied their professional learning to improve student learning (AITSL, 2014; NESA, 2019). Teachers will need to complete a specified number of registered PD hours to achieve and maintain their accreditation (NESA, Nd). The value and necessity for continued PD for all teachers is not only evident but mandated.

AITSL, in collaboration with key education stakeholders, developed the 'Australian Charter for the Professional Learning of Teachers and School Leaders' (The Charter) (AITSL, 2012). The Charter describes the importance and characteristics of high-quality professional learning in improving teacher and school leader practice and articulates the expectations for all teachers and school leaders to actively engage in continued professional learning (AITSL, 2012). The Charter reinforces the importance of a professional learning culture, acknowledging that "professional learning is most effective when it takes place within a culture where teachers and school leaders expect and are expected to be active learners, to reflect on, receive feedback on and improve their pedagogical practice, and by doing so to improve student outcomes" (AITSL, 2012, p.3). It recognises that professional learning is effective if all levels of the education system – teachers, school leaders, system leaders and policymakers share the responsibility for learning. The Charter identifies some characteristics of high-quality professional learning. It claims, "Professional learning will be most effective when it is relevant, collaborative and future focused, and when it supports teachers to reflect on, question and consciously improve their practice (AITSL, 2012, P.4).

Professional Development in Physical Education

There is a growing body of literature concerning the CPD of PE teachers. In the Physical Education Teacher Education (PETE) context, Macphail (2011) considers professional learning as a PE teacher educator; researching pre-service teachers' professional learning. In a secondary PE context, Attard and Armour (2006) explore the process of critical reflection as a professional development tool with early-career PE teachers; whilst Coulter and Woods (2012) focus on the Primary context, examining Primary teachers' experience of a physical education professional development programme. Bechtel and O'Sullivan (2006) contribute to the theoretical understanding of PD and present some of the key findings that have impacted physical educators as they participated in PD programs. The longitudinal research conducted

by Armour and her colleagues (see: Armour & Yelling, 2004, 2007; Armour, Makopoulou & Chambers, 2012; Makopoulou & Armour, 2011) looks at continuing professional development (CPD) in PE, with an emphasis on the progression of teachers' career-long professional learning.

As with the broader PD literature, the PE PD literature is fraught with concern regarding the nature and quality of PE PD provision (Armour & Yelling, 2004, 2007; Armour, Makopoulou & Chambers, 2012) and the current state of PD available for PE teachers, with a call for greater commitments to designing professional development (PD) opportunities for practicing teachers (Bechtel & O'Sullivan, 2006). These concerns echo those expressed in the wider PD literature (Borko, 2004; Day, 2004; Fishman, Marx, Best & Tal, 2003).

Significant research focusing on PD opportunities within PE reported that current forms of lack depth and challenge (Armour & Yelling, 2007) and provided little coherence or progression (Armour & Yelling, 2004), deeming them 'insufficient' and 'inadequate' in supporting teachers and facilitating change to current practice. Teachers identified a number of key concerns about PE PD, including the availability of funding, the cost and quality of teacher replacement, and problems associated with time (e.g., lack of time and a dislike of giving up personal time (Armour & Yelling 2007). Furthermore, evidence suggests a gap exists between what PE teachers wanted and need to know and what is available and that teachers' learning lacked progression over time (Armour & Yelling, 2004).

It is clear that PE PD activities, along with PD opportunities in the wider educational domain are in need of continued inquiry; particularly, if they are to have any significant impact on practice and subsequently improve the quality and standards of students learning (Armour & Yelling, 2007; Day, 2004; Fishman et al., 2003). Change is required to teacher professional learning (TPL), if there is to be a significant impact on practice and subsequently improve the quality and standards of teaching practice and students learning (Armour, 2010; Armour & Yelling, 2007; Day, 2004; Fishman et al., 2003). However, designing effective PD opportunities for teachers in PE (and other learning areas) is a difficult task (Armour & Yelling, 2004; Bechtel & O'Sullivan, 2006). The research calls for alternative models of CPD that favour a social constructivist perspective (Behets & Vergauwen, 2006; Kirk & Macdonald, 1998), where teachers are encouraged to participate in inquiry and research to facilitate their engagement in reform and improvement (Casey, 2010; Groundwater-Smith &

Sachs, 2002). Furthermore, PD opportunities need to provide opportunities for teachers to engage in critical discussion about their ideas with peers, ensuring that teachers knowledge of the subject matter, of teaching and learning, and their students is shared and valued, where teachers can "admit deficits without being considered deficient" (Bechtel & O'Sullivan, 2006, P.378).

It is argued that high-quality PD must address the needs of teachers and the contexts of their teaching lives, providing coherence and relevance (Armour & Yelling, 2004; Bechtel & O'Sullivan, 2006). Challenging and intellectually stimulating work that drives their thinking and critiquing what and why they teach and deliver physical education as they do must also be provided (Bechtel & O'Sullivan, 2006). Armour and Yelling (2007) argue, "traditional relationship between teachers and CPD provision needs to be altered such that teachers in their professional learning communities or networks play a leading role" (p. 193). Evidently, the standard of PD needs to be improved in order to improve teaching practice and hopefully increase student achievement.

Professional Development and Game Centred Approaches

Game Centred Approaches (GCAs) provide teachers with the means of delivering quality teaching and learning, whilst enhancing student learning outcomes in PE (Forrest, Wright, & Pearson, 2012; Light, 2014; Light, Curry, Mooney, 2014; Light & Fawns, 2003; Pearson, Webb, Mckeen, 2006). However, despite the potential of GCAs to improve the quality of teaching and learning in PE and its positive correlation to the analytical frameworks associated with quality teaching (Forrest, Wright, &Pearson, 2012) there is little evidence that GCA theory has penetrated practice or GCAs being adopted in teaching practice (Webb, Pearson and McKeen, 2005). Teachers attempting to implement GCAs have been offered little support and even faced ridicule and hostility in PE settings, where teachers often revert to more traditional pedagogy (Brooker, Kirk, Braiuka, & Bransgrove, 2000; Forrest, Wright, & Pearson, 2012; Light, 2014; Light & Georgakis 2005). There appears to be little research concerned with supporting teachers, particularly in-service teachers, in implementing GCAs. More specifically, there are limited studies that provide "any discussion relating to the use (and effectiveness) of GCAs in a professional development programme for in-service teachers" (Harvey & Jarrett, 2013, p. 16). The scarcity of literature in this area highlights the research gap in which this study intends to address.

Although focused on pre-service teachers, significant studies that contribute to the PD and GCAs literature are the studies of Nash (2009) and Wang and Ha (2009, 2012b, 2012c, 2013). Nash (2009) used Participatory Action Research (PAR) to explore the experiences of pre-service teachers engaged in a community of practice to support their delivery of TGfU. The findings of the study reported the successes experienced by the primary generalist teachers as a result of engaging in using a community of practice. Nash (2009) reports that the CoPs helped to develop the teachers' conceptual understandings of TGfU and self-confidence, which led to improvements in their communication skills and behaviour management strategies.

Wang and Ha (2009) examined pre-service physical education (PE) teachers' perception of Teaching Games for Understanding (TGfU) in Hong Kong. The findings were positive with the pre-service teachers identifying many strengths of using TGfU, including enhanced engagement, fostering intellectual development and inclusivity. Although, limitations of TGfU were also identified, with participants reporting the increased preparation involved in TGfU lessons, requiring more time and effort. Wang and Ha (2009) make suggestions for improving the TGfU professional development programme and collaboration between pre- and in-service teachers. In later research, Wang and Ha (2012b) researched the factors influencing pre-service teachers' perceptions of TGfU, identifying individual factors such as game knowledge, teacher beliefs, learning and teaching experience and social factors including government policy, teacher support and professional culture as key influences in pre-service teachers' perception of TGfU. In another study exploring the mentoring of 10 pre-service teachers implementing a TGfU approach, Wang and Ha (2012c) showed that the pre-service teachers' support was limited by their cooperating teachers' lack of knowledge of TGfU. However, they suggested that such mentoring programme have the potential to be more beneficial for the professional growth of in-service cooperating teachers as they extend their understanding of developments in GCAs intervention options.
Following this research, Wang and Ha (2013) examined the views, learning experiences, and understandings of pre-service PE teachers, cooperating teachers, and university supervisors of TGfU. Their findings reported the teachers' positive views on TGfU with pre-service teachers and university supervisors identified TGfU's capacity to enhance enjoyment and cater for different ability levels. Whilst, cooperating teachers perceived benefits of increased physical activity and skills acquisition of students. Despite the teachers' advocating for the implementation of TGfU, they identified the challenges during the process, including limited

space, short class time, and the unwillingness of teachers to change.

More recently, Miller, Eather, Gray, Sproule, Williams, Gore, and Lubans (2017) examine the efficacy of a 5-week CPD invention in facilitating change to the teaching practice of Primary Teachers when implementing GCAs. Their CPD intervention provided a combination of CPD strategies, including information sessions and in-class mentoring. The findings showed that the CPD was efficacious in improving the quality of PE teaching among generalist primary school teachers, showing that well-designed CPD can achieve changes in teaching practice. Notably, the findings demonstrated that teaching using GCAs enhanced the quality of the teaching and learning experiences and promoted a broad range of student outcomes improvements in game-play outcomes, in-class physical activity and Fundamental Movement Skills (FMS) were demonstrated. Importantly, this study provides a rationale for CPD that is focused on understanding the complexity of teaching that promotes high-quality pedagogy, rather than focusing on teaching for a narrow range of outcomes.

It is argued that relatively short induction periods provided for GCAs, have provided limited support and fail to develop the sufficient pedagogical skills or the content knowledge they require to teach using GCAs (Harvey & Jarret, 2013). Similarly. Physical Education Teacher Education (PETE) courses reflecting a traditional approach or providing practical subjects that consist of coaching accreditation courses in individual sports, do little to prepare teachers for implementing GCAs (Pearson, Webb, & McKeen, 2005). Harvey and Jarret (2013) supported by Light (2008), conclude that "additional GCAs induction and development measures are required… with the underpinning development of constructivist and autonomy-supporting pedagogies at its core" (p.13).

These findings suggest that there needs to be more support in PETE programmes and coach education, and within the PD of newly qualified and in-service teachers. As such, it can be assumed that teachers need more effective PD if they are to be supported in implementing GCAs that will provide high-quality learning for their students. This evident need for PD identifies a gap for this study to propose an effective model of PD that will support teachers to shift their practice to game centred pedagogy.

These concerns regarding the current provision of support to develop GCA pedagogy and content knowledge echoes the concerns voiced in the wider PE PD literature. The literature

asserts that traditional forms of teacher PD, characterised by one day, one-off, off-site workshops, with homogenised learning are inadequate and ineffective in supporting teachers to learn in ways that can enhance practice (Armour & Makopoulou, 2011; Armour & Yelling, 2004; Armour & Yelling, 2007; Casey, 2012). It could be argued that teachers need better support if they are going to implement GCAs effectively, particularly if they are to address these difficulties and overcome these pedagogical and conceptual barriers that prevent them from implementing GCAs.

Moving forward, Harvey and Jarrett (2013) make recommendations for future research looking to support teachers in implementing GCAs and foster the development of GCAs use, to explore the use of active CoPs as highlighted by Nash (2009). Moreover, they guide future research to make use of mentoring programmes involving pre-service and in-service teachers, like the initiative used by Wang and Ha (2012c). This study considers the recommendations by Harvey and Jarrett (2013) and proposes to use and expand on the research by Nash (2009) and Wand and Ha (2012b, 2012c, 2013).

As previously outlined, there appears to be limited research regarding in-service teachers; particularly regarding their perceptions of implementing GCAs and the professional development of in-service teachers. Interestingly, Butler (2005) identifies old dogs' or experienced, in-service teachers as key players in facilitating change, advocating them as the 'gatekeepers to innovation' (p.226). She suggests they play a key role in shifting pedagogy in schools and bridging the 'chasm between theory and practice' (Butler, 2006, p.228). If supported, in-service teachers could have the potential to bridge this disconnect and translate the GCAs theory into practice. It could be contested that there needs to be more effective professional learning opportunities to support in-service teachers in implementing GCAs, particularly as PD opportunities are critical mechanisms to facilitate teacher learning (Bechtel & O'Sullivan, 2006). Considering this dearth of research with in-service teachers, this research seeks to work with in-service, experienced teachers, whilst seeking to understand how best to support them in their implementation of GCAs.

Action Research

Kurt Lewin pioneered action research in the mid-1940s. Lewin (1946) argued, to "understand and change certain social practices, social scientists have to include practitioners from the real social world in all phases of inquiry" (McKernan, 1991, p.10). Lewin (1946) describes

action research as “a spiral of steps, each of which is composed of a circle of planning, action and fact-finding about the result of the action” (p.38). The first order action research, according to Elliot (1991), is the study of a social situation with a view of improving the quality of professional action within it, while the objective of the second-order action research encompasses educational research. As such, in an educational context, AR is an educational research strategy that was developed during the ‘teacher as a researcher’ movement (Stenhouse, 1975). ‘Teacher as researcher’ (Stenhouse, 1975) encourages teachers to develop their professional learning from their own professional experiences. David Hargreaves (1996) has presented the case for, among other substantial changes, greater involvement of teachers as practitioners in the research process, to establish a reliable, evidence-base of what ‘teachers do in classrooms’ (p. 7).

Action research is consistent with the constructivist movement in education; it assumes that individuals learn best when they are given responsibility for developing their own knowledge and understanding (Gall & Vojtek, 1994). AR actively involves teachers in their own educational process, where they explore their own practice to understand better how they can support students’ learning. It puts the “teacher at the centre of the professional development process” (Gould, 2008, p. 5), leading to self-understanding, professional growth, and political change (Noffke & Stevenson, 1985). Moreover, Griffin, Brooker and Patton (2005) advocate “field-based research needs to be an essential part of good development work thus leading us toward research-based practice (p. 213).

The ‘products’ of AR generally include the generation of knowledge about teaching and learning, increased understanding of practice, and improvements in teaching and learning (Kemmis & McTaggart, 1988). As Sagor (2000) suggests, “The primary reason for engaging in action research is to assist the actor in improving or refining his or her actions” (p.134). Gall and Vojtek (1994) suggest that AR as a PD model requires teachers to do their own research within their immediate work setting; testing to test new ideas or answer questions they have posed. They state, “action research is more systematic than trial and error because it draws on methods used in scientific research” (p. 32). Additionally, Hargreaves (1994) highlights action research as having a more effective role in advancing the professional quality and standing of teachers.

Action Research as Professional Development

The teacher PD literature has shown a trend for action research, exposing the implementation of AR as a tool for improving professional practice in schools. Action Research adopts a 'bottom-up- approach view of teacher development, empowering teachers as 'generators od professional knowledge' as opposed to being mere recipients of someone else's knowledge (Burns, 2000). Much of the work of David Hargreaves (2012) on self-improving school systems, advocates action research (or joint practice development) as part of his PD model in schools. In other subject areas, Chou (2011) investigated a group of in-service elementary English teachers' learning to do action research when they were involved in a professional learning community. Their research reports the extent to which action research is an effective approach concerning teachers' PD.

Similarly, Action research was an integral component of Çorlu and Çorlu's (2012) PD model when studying prospective physics teachers in Turkey. They accredit the successful PD of their student teachers to two common learning strategies, action research and learning cycle. Çorlu and Çorlu (2012) report the improvements in student teachers' teaching skills and strategies, including a range of secondary skills concurrently developed through action research cycles such as (i) Laboratory management skills, (ii) presentation skills, (iii) skills to increase student participation, (iv) time management, (v) safety procedures, (vi) questioning techniques.

The notion of teachers as active, social learners, working in communities of practice and situated in their own school context, is consistent with the notion of AR and 'teaching as inquiry' involving teachers in cyclic processes that pose questions about the impact of teaching on student learning (Crocket, 2002, Ermeling, 2012). The assumption underpinning this research was that as teachers developed a better understanding of their teaching practice as a result of being part of the action research process, they would be better able to improve their practice, which in turn would support students in achieving better outcomes. AR, or insider research methodologies have been used in many educational settings (see Kemmis & McTaggart, 1982), including PE (see Tinning, Macdonald, Tregenza, & Bousted, 1996).

Action Research and Physical Education

Despite an initial lack of exposure of Action Research in PE and a dearth of literature in early

PE research, suggesting action research has made little impact in the field of PE (Casey & Dyson, 2009; Casey, Dyson, Campbell, 2009; Tinning, 1992); it appears that Action Research is finally gaining credibility within the field of both PE and TPL. Kirk (1995) identifies action research as a strategy for improving teaching and learning in PE. Some physical educators in teacher education who use, or advocate action research methods include Baker and Stanley (1994), Gore (1991), Casey (2012a, 2012b), Casey and Dyson (2009), Casey, Dyson and Campbell (2009), Kirk (1983, 1995), Lawson (1991), Martinek and Butt (1988), Sparkes (1991), and Tinning (1987, 1992).

The work of Kathy Armour and her colleagues exploring the career-long professional learning of PE teachers (see: Armour and Makopoulou, 2011, 2012; Armour, Makopoulou & Chambers, 2012; Armour and Yelling, 2007, 2004) has extensively contributed to the AR literature. Significantly, Armour and Yelling's (2004) study into the effective provision of PD with a cohort of teachers as part of a master's program study, reports the valuable role action research has in teacher change and development.

Additionally, Ashley Casey and his growing body of research (see Casey, 2012a, Casey, 2012b; Casey & Dyson, 2009; Casey, Dyson & Campbell, 2009) has made a significant contribution to the field of action research in Physical Education. Casey (2012a) reports a self-study of pedagogical and curricular change through reflective practice and 'insider' action research, showing action research as a tool for positioning the practitioner in the 'betweenness' of theory and practice. In his article exploring the current demands placed on teachers to engage in year-on-year CPD as a means of showing their ongoing competence to teach; Casey (2012b) recognises the opportunity presented by CPD to raise teachers' awareness of the potential benefits of educational research findings. Casey (2012b) highlights the significant role practitioner research such as action research must play in the ability of CPD programmes to stimulate reflection and professionalism, rather than merely serving as places where teachers can access new units of work.

Action Research and Game Centred Approaches

Len Almond (in Bunker, Thorpe, & Almond, 1986) pioneered the use of action research in PE and GCAs with his work using the TGfU model. In 'Rethinking Games Teaching' (Bunker, Thorpe, & Almond, 1986), Almond encouraged teacher involvement in educational

research, advocating action research for its potential to enable teachers to learn more about their pupils, their teaching and games. Later, Hopper (1996) used action research to support student teachers learning to teach PE using TGfU, in a community based after school games program. The practical AR process allowed the student teachers to "free themselves of the didactic teaching they had experienced in physical education" (Hopper, 1996, p.23) and supported them to develop practical knowledge of teaching games, to teach using TGfU effectively.

In later work, Gubacs-Collins (2007) used action research to examine the implementation of a tactical approach to teaching tennis in a pre-service teacher education setting; describing the first action research cycle of planning, acting, observing, and reflecting on the implementation of a tactical approach to teaching games. Her results provided detailed insight into the lessons learned as a teacher educator when implementing game centred pedagogy and as a researcher using action research. Interestingly, Gubacs-Collins (2007) reported the rewards for herself and her students using a tactical games approach and action research; claiming the "in-depth reflective experience brought me closer to my students both as a professional and as a fellow teacher" (p.123). The collaborative nature of action research was a motivator for all parties, especially for her.

Notably, Gubacs-Collins (2007) reports the feelings of becoming a novice teacher again when using the tactical model for teaching games and shares the struggles between long-standing habits of traditional thought and practice and the different thinking and practices required by a tactical approach. However, she confirms that these struggles can be overcome, and a tactical model can provide improved tactical knowledge and increased interest and excitement for both the teacher and students. This research of Gubacs-Collins (2007) supports action research as a framework for improving practice when integrating GCAs. However, it is still concerned with PE Teacher Education rather than in-service teachers. This study provides an investigation that concerns in-service teachers, an area where there appears to be a research gap.

Casey and Dyson (2009) also used action research as a framework to investigate cooperative learning and tactical games as instructional models in PE. The study followed Casey, an experienced teacher/researcher's reflexive introspection when implementing a hybrid model of TGfU and Cooperative Learning (CL). Casey took on the role of a first-person action

researcher and engaged the participants in the role of action research. Interestingly, Casey and Dyson's (2009) results echoed those of Gubacs-Collins (2007), reporting the need to relearn the sport from a new perspective in order to teach using this hybrid model. Casey and Dyson (2009) advocate the use of action research, suggesting, "Action research is a way to problematize teaching and seek to better understand both the issues involved and the ways to improve one's practice of teaching" (p.188).

Nash (2009) used Participatory Action Research (PAR) to explore the experiences of pre-service teachers engaged in a community of practice to support their delivery of TGfU. Again, this research focused on pre-service teachers. However, the results go some way to supporting how pedagogic practice can be developed through cultivating a community of practice using PAR. The PAR allowed pre-service teachers to work quickly to solve common problems that were appearing across the community and to develop a sound understanding of the TGfU model and how it can be used to enhance pupils' experience of PE lessons.

In their review of the GCAs literature, Harvey and Jarret (2013) recommended that GCAs research should continue its expansion using research designs and data collection techniques that aid the examination of different philosophical understandings of GCAs. They suggest that action research, through its in-depth, situated analysis, provides a means of meeting this recommendation. Moreover, Harvey and Jarret (2013) endorse further research into the optimal length of GCAs induction and training for pre-service and in-service teachers and coaches. Indeed, there is a need for more research concerning in-service teachers since the research is mostly concerned with pre-service teachers. Through action research, this research study has the potential to explore both recommendations, with its specific focus on in-service TPL.

Productive Pedagogies and Game Centred Approaches

The concept of Productive Pedagogies is a key feature in contemporary educational practice, particularly concerning improving the quality of teaching and learning. Research into Productive Pedagogies claims that quality teaching can improve outcomes for all students, where good teachers make the greatest difference to student outcomes (Hayes et al., 2006). Links between the Productive Pedagogies framework and teacher PD can be seen, where transparent pedagogy is encouraged; a common language is provided, allowing teachers to plan, describe, monitor and critically reflect on teaching (Bowes & Tinning, 2015). This

common language enables teachers to "...engage in substantive professional dialogue of the sort that improves their classroom practices" (Hayes et al., 2006, p. 6). Similarly, the principles of GCAs align with the instructional practice described by the Productive Pedagogies framework, providing quality learning experiences for students when teaching games in PE.

The literature on Productive Pedagogies has emerged from the work on Authentic Pedagogy by Newmann and Associates (1996) and reform initiatives in Queensland schools within Australia, commissioned by the state's Department of Education and Training (DET) (Queensland Schools Reform Longitudinal Study [QSLRS], 2001; Hayes et al., 2006). Classroom practice was observed and coded to explore what forms of practice contribute to more equitable and increased outcomes for all students, identifying what makes for quality teaching and learning. This body of work later informed Hayes et al.'s (2006) work that interrelates Productive Assessment and Productive Performance (see: Teachers and Schooling: Making a Difference; Hayes et al., 2006).

Productive Pedagogies reflect the broader contemporary educational context that "values higher-order thinking, critical inquiry and improving educational outcomes for students through the conceptualisation of these three concepts in school classrooms" (Bowes & Tinning, p.96). The notion of Productive Pedagogies is underpinned by learning theory, critical literacy, critical and curriculum theory (Mills et al., 2009). These theories represent a shift in how students learn, providing an elaborated and extensive engagement with pedagogy from various psychologically and sociologically informed perspectives (Sellar & Cormack, 2007).

Productive Pedagogies focus on using 20 pedagogical elements, aligned under four pedagogical dimensions: intellectual quality, connectedness, supportive classroom environment, and working with and valuing difference to improve educational outcomes for students (Hayes et al., 2006, p. 35). The Productive Pedagogies framework emphasises the full range of domains from individual cognitive processes through constructivist epistemologies to classroom environment and engagement with social-structural issues that impede certain student groups from succeeding within the mainstream curriculum (Sellar & Cormack, 2007).

This Productive Pedagogies framework later informed the NSW Department of Education and Training, Quality Teaching Framework (QTF), which presented a model of pedagogy to be incorporated in all teaching and learning programs in all NSW Department of Education schools,

> to ensure that quality education is being provided throughout the school and as a means of providing staff with a platform for critical reflection and analysis of current teaching practice and used to guide planning of classroom and assessment practices
>
> (NSW, Department of Education, 2008).

The NSW Quality Teaching Framework (QTF) (NSW DEC, 2003) draws similarities to the model of Productive Pedagogies, highlighting 18 pedagogical elements collected under three dimensions of pedagogy: intellectual quality, quality learning environment and significance have been linked to improved student outcomes. The QTF provides a lens through which teachers can evaluate the quality of their teaching practice across school settings, stages of learning and different key learning areas, enabling teachers to develop a deep understanding of what constitutes quality in teaching (Collins, 2017).

Despite the Productive Pedagogies framework being widely adopted in Australia and internationally, both as a research tool and metalanguage to support teachers to critically reflect on their practice (Mills, Goos, Keddie, Honan, Pendergast, Gilbert, Nichols, Renshaw & Wright, 2009), the framework has all but disappeared in Queensland schools, with Marzano and Kendall's (2007) Taxonomy of Educational Objectives underpinning Queensland's Curriculum & Assessment Authority's design of the new syllabi. Even with the introduction of the Australian Curriculum, there does not appear to be a common framework for pedagogy in place in Australian schools. Contrarily, the NSW Quality Teaching Framework is still used and institutionally endorsed in the NSW Department of Education schools. This traction can be attributed to the University of Newcastle's Quality teaching rounds (QTR) approach to professional development. The QTR approach combines ideas of 'rounds', Professional Learning Communities (PLCs) and the Quality Teaching framework to build teachers' capacity to improve teaching quality and student outcomes (see Gore, Lloyd, Smith, Bowe, Ellis, Lubans, 2017; Gore & Rickards, 2020; Gore & Rosser, 2019; Miller, Gore, Wallington, Harris, Prieto-Rodriguez & Smith, 2019).

In Physical Education (PE), the concepts of Productive Pedagogies and the dimensions of the Quality Teaching Framework (NSW, DET, 2003) can be achieved through the implementation of Game Centred Approaches (GCAs). Curry (2012) argues that GCAs provide the basis of high-quality pedagogy in PE beyond the teaching of games. Research linking GCAs to quality teaching in Physical Education (PE) (see: Light, 2014; Light, Curry, Mooney, 2014; Light & Fawns, 2003; Pearson, Webb, Mckeen, 2006), highlights the capacity of GCAs to enhance quality teaching of games and address elements such as deep understanding, higher-order thinking, student direction and inclusivity. GCAs provide an ideal means through which PDHPE teachers in NSW can address the NSW Quality Teaching Framework when teaching games and sport, providing high-quality learning experiences for students and making PE a truly valuable educational experience in NSW schools (Pearson, Webb & McKeen, 2005; Curry & Light, 2007).

Light and Fawns (2003) argue that GCAs offer a means for bringing PE into the mainstream school curriculum by offering the ideal holistic learning experience that simultaneously provides for cognitive, affective, social, and physical learning. These approaches are more enjoyable for both teachers and students and the pressure of skill and technique focused PE is removed which gives non-specialists the confidence to provide a variety of experiences and allows them to integrate other concepts (Curry, 2012, Light, 2012).

Clear parallels can be drawn between the instructional practices promoted in the Productive Pedagogies' literature and those underpinning GCAs. The research surrounding Productive Pedagogies aligns with the shift towards adopting more student-centred, inquiry-based approaches in the classroom. Games-based pedagogy is underpinned by constructivist learning theory with beliefs in student-centred learning approaches. In GCAs, skills are learnt through the context of a game, which allows the skill to become more meaningful and authentic since it is being learned in the correct context. Many researchers have aligned GCAs with constructivist and situated-learning theory (see Butler, 1997; Kirk & Macdonald, 1998; Kirk & MacPhail 2002; Light, 2002; Light & Fawn, 2002). Learning in GCAs takes place in authentic conditions, where the learner is actively engaged in problem solving and decision-making, through modified gameplay and game progression and the use of questions, discussions and reflection. Indeed, linking GCAs with constructivism seems to add weight to the argument to shift pedagogy to more game-centric practice.

Background to GCAs

Game Centred Approaches (GCAs) are not a new concept in PE. Bunker and Thorpe (1982) initiated the GCA dialogue with the introduction of the Teaching Games for Understanding (TGfU) 'curriculum model' over 30 years ago. Bunker and Thorpe (1982, 1989) and later Thorpe, Bunker, and Almond (1984) expressed their concern that students taught with a technical approach, focused on technique development, experienced little success, showed little understanding about games, and demonstrated inflexible techniques and poor decision-making. In their initial review of the GCA literature, Oslin and Mitchell (2006) summarise the failings of traditional approaches to teaching games, highlighting the low self-efficacy, low self-perception of students' movement abilities and the disengagement, particularly of inexperienced students.

The TGfU Curriculum model shifted the emphasis in the teaching of games, to the tactical considerations as opposed to focusing on specific motor responses (techniques). The adoption of game-centred practice represents a shift in pedagogy from traditional practice, focused on technique and governed by skill practice, to teaching that is more student-centred and learning that is more contextualized and situated, for example, small-sided, modified games. In their TGfU model, Bunker and Thorpe (1982) embedded four pedagogical principles (i.e., sampling, modification-representation, modification-exaggeration, and tactical complexity) to assist teachers in creating appropriate learning activities. Similarly, modifications can include adapting equipment, playing areas, mobility of players or rules to constrain or guide learners toward solving a tactical problem, such as how to maintain possession of a ball as a team or how to defend against dribbling opponents. Progressions for GCAs lessons and activities need to consider individual learners needs, as in a student-centred approach.

Many researchers have scrutinised the original model, reconceptualising it and developing alternatives. Since the introduction of TGFU in 1982, there have been many derivatives building on the work of Bunker and Thorpe. The most prominent GCAs acknowledged in the literature are play practice (PP), (Launder, 2001); Game Sense (GS), (Light, 2004) and the tactical games model (TGM), (Mitchell, Oslin, and Griffin, 2006). These approaches are all unified around the premise that the best way to teach students to understand games is through the context of small-sided and modified games. The consensus amongst these approaches is

that students learn best through situated learning experiences, where the teacher uses a range of pedagogical tools to reduce the complexity of the game or to exaggerate tactical elements of a game by using modified game forms.

Much of the literature surrounding these approaches report a range of quality outcomes for the learner as a result of game-centred pedagogy. Research has reported the potential of GCAs to enhance participant motivation (Evans & Light, 2008; Mandigo, Holt, Anderson & Sheppard, 2008), and engagement (Pearson, Webb, McKeen, 2005; Wright, McNeill, and Fry, 2009). The literature has also showed the potential of GCAs to improve tactical transfer between sports (Hastie & Curtner-Smith 2006; Memmert & Harvey, 2010; Memmert & Roth, 2007), promote the development of tactical knowledge (Butler, 1997; Gréhaigne, Godbout & Bouthier, 1999; Griffin, Mitchell & Oslin, 1995; Rovegno, Nevett & Babiarz, 2001) and develop effective decision-makers (Díaz-Cueto, Hernández-Álvarez & Castejón, 2010). Researchers have compared both technical and tactical approaches to teaching games and reported GCAs potential to develop tactical knowledge and performance (Martinek & Turner, 1997).

Stolz and Pill (2013) criticize these competing descriptions of TGfU in the PE literature, suggesting they complicate the understanding of the approach and its practical implementation. Similarly, Rossi, Fry, McNeill, and Tan (2007) suggest the many forms of GCAs have led to confusion between models, which may account for the difficulties teachers express with their implementation. Although, as Mitchell (2005) emphasises, there are similarities and differences between each of the GCAs derivatives, but ultimately, they are same ‘paths up the same mountain’.

As with productive pedagogies, the role of the teacher is pivotal in supporting student learning when implementing GCAs. GCAs require the role of the teacher to change to accommodate the changed focus of learning, where teachers adopt the role of a facilitator, placing the learner at the centre of the learning experience (Butler, 2006; Griffin & Butler, 2005;). Dyson, Griffin and Hastie (2004) suggest, “the teacher purposefully shifts responsibility to the student engaged in authentic, meaningful, & learning tasks” (p. 226). This transformation in the teaching role places great pedagogical and conceptual demands on the teacher (Casey & Dyson, 2009; Dudley & Baxter, 2009; Light & Georgakis, 2005) and requires considerable pedagogical skill and a deep understanding of games (Light &

Georgakis, 2005; Turner, 2005). Kirk (2005) asserts, "TGfU is more demanding of teachers' pedagogical content knowledge and subject matter knowledge than is the traditional approach" (p.215). Chow, Davids, Button, Shuttleworth, Renshaw and Araujo (2007) suggest, "The challenge for teachers is not just to understand how to manipulate constraints but to identify the key individual constraints that can be presented to students to encourage learning" (p. 273). The teacher is required to identify teachable moments within the game and facilitate learning with timely and appropriate questions, through selecting appropriate game forms that develop game understanding (Chandler, 1996; Howarth, 2005; Light & Georgakis, 2005; Turner, 2005). This requires the appropriate manipulation of task constraints, allowing all learners success in the game, where suitable modifications to the game are made to generate meaningful play (Mitchell, Oslin, & Griffin, 2005).

In GCAs, the teacher is required to stand back and facilitate the learning through their creation of developmentally appropriate learning environments; they are then required to modify the game further to ensure progression. Teachers are required to create a puzzle to be solved and provide problems for the student to answer. The difficulty for the teacher is to identify "where the problems lies in regard to students understanding and to elucidate the obstacles to constructing efficient responses to particular tactical problems" (Butler & Griffin, 2005, p.22). Butler and Griffin (2005) explain, "much more research and development work is needed to understand how to facilitate the development of game knowledge" (p.13). This study aims to address this need, through exploring what teachers need in order to ensure quality-learning outcomes, when teaching games.

Significance of GCAs in Physical Education in Australia and NSW

Recently, the education sector in Australia has moved towards a national approach to education, developing and implementing the first Australian National Curriculum. For the first time, students have access to the same content, and their achievements can be judged against consistent national standards. The Australian Curriculum and Assessment and Reporting Authority (ACARA) were responsible for developing the Foundation – Year 10 Australian Curriculum in HPE, where education ministers endorsed it in September 2015. Implementation of the Australian Curriculum is the responsibility of states and territories. In NSW, the NSW Education Standards Authority (NESA) is responsible for developing syllabuses for NSW schools. The new NSW syllabus PDHPE syllabus was released in 2018

with the desired implementation in all NSW schools from Kindergarten to Year 10 in 2020.

The new Foundation to Year 10 (F-10) Australian National Curriculum for Health and Physical Education (HPE) features links to GCAs through its emphasis on students' acquisition of skills, concepts and strategic awareness, the development of communication, decision-making and goal-setting skills and the appraisal of performance (ACARA, 2012). Similar links are found in the 2018 NSW PDHPE syllabus (NESA, 2018), where students are expected to apply and transfer movement skills, identify appropriate strategies and tactics, and solve increasingly complex movement challenges.

In support of the new F-10 National Curriculum for HPE and the 2018 NSW PDHPE syllabus, the NSW DEC has developed and published the K-10 Physical Literacy Continuum for use in NSW Government schools (NSW, DEC, 2014). The Physical Literacy Continuum maps the learning pathway, growth or development of a typical student. The knowledge, understandings, skills and attitudes regarded as 'critical to life-long participation in and enjoyment of physical activity' (NSW, DEC 2014) outlined in the PL continuum, are consistent with that of philosophical underpinnings of GCAs. Game-centred pedagogy is embedded in the 'tactical movement' and 'movement competencies' aspects of the continuum; where 'thinking in action', 'knowledge of physical activity contexts' and the development of a combination of movement skills in a variety of physical activity setting, are all featured.

Implementation issues with GCAs

Whilst Game Centred Approaches have become a prominent and prevalent feature within research, it is argued that their impact within the practices of PE has yet to be fully realised and achieved (Pearson, Webb & McKeen, 2005; Stolz & Pill, 2013). Research suggests that GCAs are not as widely accepted by PE teachers, as they are by academics (Almond, 2010), illustrating the "disparity between researcher as theory generator and teacher practitioner as theory appliers" (Stolz & Pill, 2013, p.1). Forrest, Webb and Pearson (2006) argue, GCAs are yet to make a significant impact upon teaching in NSW.

GCA theory has been limited in its capacity to penetrate practice; it has made an insufficient impact to transform the teaching of games within PE (Forrest, Webb & Pearson, 2006;

Pearson, Webb & McKeen, 2005; Stolz & Pill, 2013). It appears that there is an evident disconnect between what is suggested in theory and what is done in practice (Light, 2013; Stolz & Pill, 2013). Traditional approaches to PE still dominate teaching practice in Australian schools (Kirk, 2010; Pearson, Webb, & McKeen, 2005). Entrenched mindsets and exposure to more traditional approaches to learning (Light & Georgakis 2007), effects of culture (Light & Tan 2006) and problems with high-level questioning (e.g. McNeill, Fry, Wright, Tan, Tan & Schempp, 2008) have all been attributed to the evident lack of uptake of GCAs. Traditional methods, characterised by linear, performance-based teaching practice with skill-drills and technique practice prevail. The concern is that these prevailing pedagogical approaches continue to marginalise and alienate students and are insufficient in achieving worthwhile educational outcomes for students (Cothran 2001; Ennis, 1999; Kirk & MacDonald, 1998; Light & Georgakis, 2005). Moreover, it is claimed that teachers revert to traditional approaches of teaching games when experiencing difficulties with GCAs (Brooker et al. 2000; Light, 2004; McNeill et al., 2004). Technique driven practice, is the default approach for teachers, regardless of their beliefs and values of game-centred practice.

Most of the current literature surrounding teachers and their perceptions of GCAs or teachers' responses to implementing GCAs are focused on pre-service teachers. There appears to be a dearth of literature focusing solely on in-service teachers. In their review of GCAs literature, since 2006; Harvey and Jarrett (2013) report that out of the twenty-three studies they identified to be focused on teachers' perceptions of employing GCAs or teachers' responses to their implementation of GCAs, only three studies focused on in-service teachers and one including a combination of pre-service and in-service teachers.

In the literature concerning in-service teachers, Casey and Dyson (2009) examined a teachers' response when implementing a hybrid TGfU–Cooperative Learning unit, reporting the pedagogical and time constraints experienced when planning and delivering the unit. Díaz-Cueto, Hernández-Álvarez, and Castejón (2010) reported the rewards and barriers experienced by in-service teachers when using TGfU in teaching sports. Like Casey and Dyson (2009), Díaz-Cueto, Hernández-Álvarez, and Castejón (2010) report that teachers experienced feelings of concern and anxiety and a "deep sense of insecurity" when first implementing TGfU. Similar parallels were drawn with Casey and Dyson (2009) regarding the time constraints because of the changing dynamics of the lesson. However, they did report the satisfaction experienced by the teachers when observing improvements in the

students' learning as a result of the TGfU lessons.

In other research that reports the views of Singaporean in-service teachers on implementing GCAs; Rossi et al. (2007) highlight the confusion experienced by the teachers as a result of the many different forms of GCAs. Furthermore, despite their PD initiative showing that "'new' ideas about the GCAs were both welcomed and sought" (p.108) there was "limited extrinsic rewards or intrinsic motivation" to support teachers to adopt GCAs. Evidently, in the minimal literature that does focus on in-service teachers and response to GCAs, it is clear to see that teachers experience several difficulties, both pedagogically and conceptually, when attempting to implement game-based pedagogy.

Harvey and Jarrett (2013) report that the relatively short induction periods provided for GCAs, have provided limited support and fail to develop the sufficient pedagogical content knowledge to teach using game-centred pedagogy, recommending that additional induction and development measures are required.

In his research focusing on the experiences of cricket coaches when implementing TGfU, Roberts (2011) highlighted several pedagogical, conceptual, cultural and political dilemmas presented by game-centred pedagogy. Pedagogical issues were related to questioning strategies used as part of the TGfU approach. Coaches struggled to as a 'good' question, which Roberts links to a good in-depth understanding of the game. Similarly, McNeill et al. (2008) also report pedagogical difficulties with questioning in their study of primary school student teachers. The pre-service teachers struggled to formulate questions that enhanced critical thinking and tactical awareness, as intended with GCAs.

Roberts (2011) also identified problems insufficient levels of pedagogical content knowledge when implementing TGfU, also highlighted in previous studies with PE teachers (Rovegno 1998) implementing a constructivist approach to a movement approach PE. Rovegno (1998) revealed the difficulties teachers have knowing what to say, what to look for in lesson and how to break learning down into teachable progressions and how to generate questions as a result of limited PCK.

The cultural dilemmas faced by the coaches in Roberts (2011) study, included tensions within the coach-player relationship. Light and Tan (2006) report the effects of culture when

implementing GCAs, noting significant cultural implications in societies with differing social conventions with the resultant impact potentially affecting the interpretation, use and effectiveness of the approach adopted. Similarly, Rossi et al. (2007) indicate the influence of culture on the experiences of GCAs, noting the 'pedagogical risks' associated with implementing GCAs 'is not part of the Singaporean teachers' technicist mindset' (p. 108), explaining shifting pedagogy to support a more cognitive approach to teaching games, goes against a 'dominant discourse of corporeality' (p. 108). Finally, the political dilemmas outlined by Roberts (2001) suggest that Non-Government Bodies could provide more guidance on the use of TGfU and regular professional development opportunities. The coaches were disappointed with the availability of practical TGfU resources.

There is an 'epistemological gap' (Light, 2008) between GCAs theory or the research that is being conducted and teaching practice, where teachers fail to understand the research implications and struggle to implement game-based lessons effectively. Memmert et al. (2015) state, "implementing a game-centred approach like TGfU demands complex professional learning that considers a wide range of contextual factors within the educational setting" (p. 9). Teachers need to be supported with effective professional endorsement that provides them with knowledge and skills they can implement in their teaching routines if they are to implement GCAs in practice effectively. Memmert et al., (2015) advocate the need to "build a collaborative venture to ensure that new research (in all of the diverse fields) is made accessible in forms that can be "turned" into guides that become a significant and sustainable part of everyday professional practice" (p.9).

The Relevance of the literature to this study

This chapter has reviewed the literature on PD, AR and GCAs. It has identified the research base for supporting teachers in implementing games-centred pedagogy with the aim to improve students' learning outcomes. The following gaps occur:

- There is a need to re-evaluate and re-conceptualise what effective PD looks like
- There needs to be a better understanding of the teacher change process
- There is little research that examines in-service teachers' implementation of GCAs
- There is limited research that looks specifically at teacher professional learning when implementing GCAs
- There is limited research that focuses on evaluating the most suitable use of pedagogy

based on game-centred approaches to achieve the best outcome for students' learning results

- Little is known about how to bridge the epistemological gap between theory and practice for the implementation of GCAs to be effective and ensure quality outcomes for the students.

As such, there is a need to explore the professional learning required to effectively support in-service teachers in implementing game-centred pedagogy to ensure they provide quality-learning outcomes for their students. This study proposes to address each of these gaps through developing an approach that can be used by teachers to plan, teach and assess a GCAs program of work for themselves and others that is teacher-led, sustainable and needs-based. In doing so, it is hoped that this will build a collaborative venture between the teacher and the researcher. In this way, this research will bridge the 'epistemological gap' (Light, 2008) between theory, what is said in the research, and practice, what is done in schools. Thus, ensuring research in the field of GCAs and PD is suitable, significant and accessible to teachers and translated into sustainable professional practice in schools.

Chapter Conclusion

This chapter has reviewed a section of the literature relevant to the professional learning required to support in-service teachers in their implementation of an innovative, syllabus mandated pedagogy, namely GCAs. It has explored the literature under the three main themes pertinent to the study, this included PD, AR and productive pedagogies, specifically in the area of teaching games using GCAs. Relationships between the three themes were identified, and relevant literature was used to illustrate the links. The benefits of PD models using collaborative, site-based, inquiry approaches were discussed, along with the growing trend of action research in the field of PD and PE. Concerns for current PD opportunities in education were highlighted along with the limited research that looks at in-service teachers and the role of professional learning to support the implementation of innovative approaches. The role of GCAs as an innovative and productive pedagogy in education was explored, along with the difficulties and uncertainties experienced when implementing them in teaching practice.

In summary, traditional PD opportunities may have little value in supporting and facilitating change to teaching practice if the PD research is a reliable indicator. If teachers are going to

be supported in implementing GCAs, they need to be provided with effective PD that can empower them with the knowledge and skills they need to transform their practice. An exploration of alternative PD approaches based on the notions of collaborative and cooperative capital, as espoused by CoPs and PLCs are worth exploring to determine the facilitators and barriers to implementation and the potential efficacy of such approaches.

Chapter 3

Research Frameworks and Professional Development Model

Introduction

This chapter will focus on the underlying conceptual and theoretical frameworks and associated assumptions that guided this study. Specifically, this chapter will provide an overview of the study related theories and frameworks, an understanding of how the frameworks are applied and the designing of the professional development (PD) model. Furthermore, these frameworks are explored through the educational context of teacher professional learning.

Conceptual framework

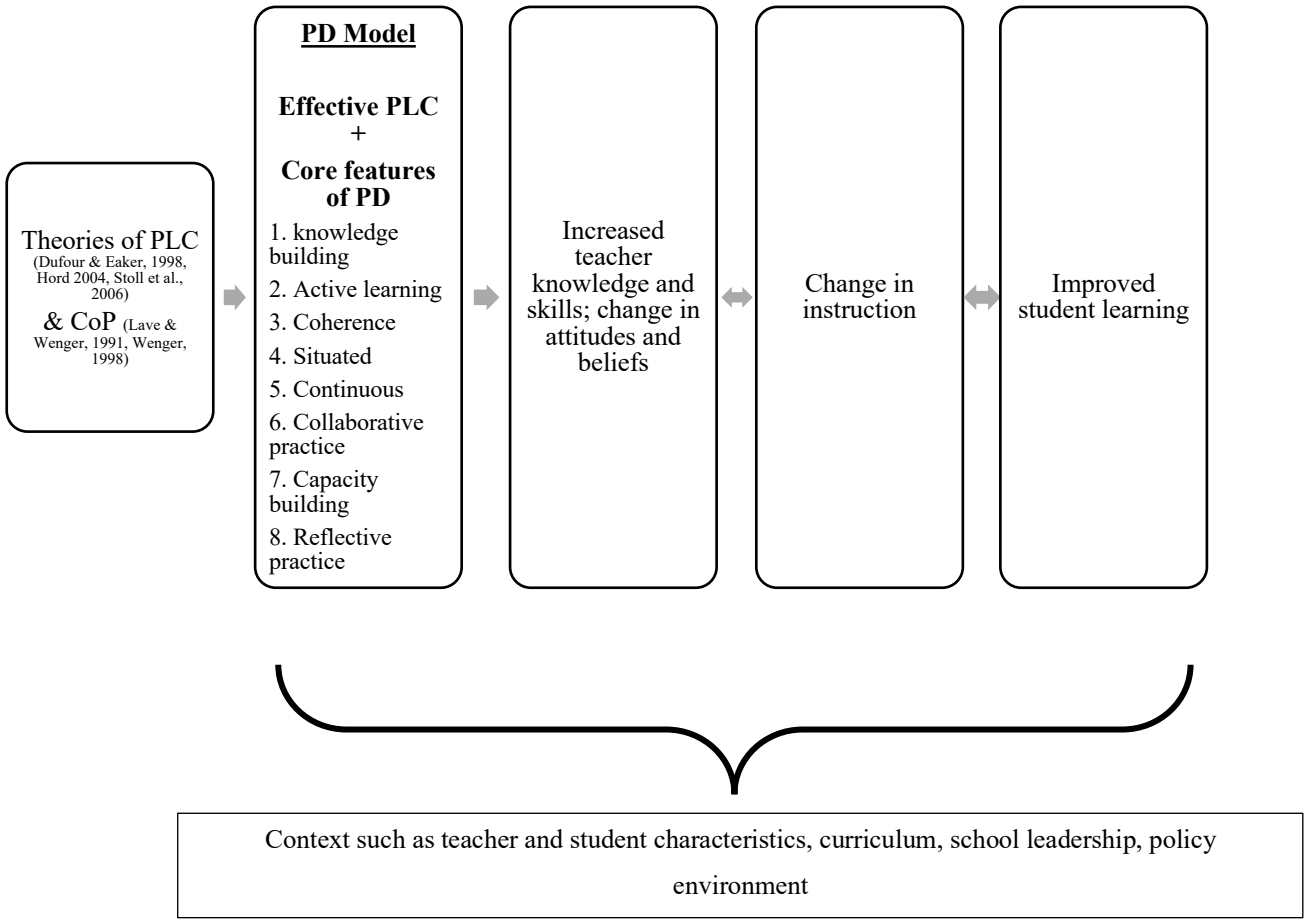
The conceptual framework for this study provides an overall structure for the research that explores teacher professional learning, presenting reasons why learning may or may not occur as a result of PD activity, with those reasons rooted in the literature, whilst considering how teacher learning might be supported when designing and implementing Game Centred Approaches (GCAs). The conceptual framework clarifies, explains and justifies the methods used within this study (Maxwell, 2013), arguing why the topic matters and why the proposed design and methodology are appropriate and rigorous (Ravitch & Riggan, 2017). The research methodology section of this thesis addresses each of these elements, forming a conceptual base for the study, arguing the importance of studying teacher professional development, and explaining the relationships between teacher professional learning and GCAs.

The researcher's experiences and interest in GCAs and teacher professional learning, as a result of her teaching practice and leadership roles, formed the impetus for the study providing the stimulus for the conceptual framework. These experiences and interests are detailed in the researcher's biography (Appendix 3) and examined when discussing the ontological beliefs in the research methodology section. The literature review (Chapter 2) provided a foundation for the conceptual framework, identifying the significance and need for this grounded within teacher professional learning and the context of Physical Education (i.e. the teaching of games). As such, the literature review presents the extent to which the topic has been studied, what is still needed to be understood about it, and whether the

discipline needs to address the lack of knowledge (Booth, Colomb, Williams, Bizup & Fitgerald, 2016; Crawford, 2019).

This study's conceptual framework is graphically presented in Figure 2. It draws on Desimone's (2009) work in professional learning and development, establishing the same operational guidelines and features of how PD influences teacher and student outcomes. As with Desimone (2009), the framework shows the interactive, non-recursive relationships between the critical features of professional development, teacher knowledge and beliefs, classroom practice, and student outcomes. This thesis built on the five core features identified by Desimone (2009) (i.e. content, active learning, coherence, duration, collective participation) by drawing on other PD literature, focusing specifically on the effective features of PD in Physical Education (PE) (i.e. knowledge building, active learning, coherence, situated, continuous, collaborative practice, capacity building, reflective practice). This framework provides a more robust list of characteristics deemed effective in supporting teacher learning in a PE context (see Figure 2). These features are further narrated when discussing the PD model posited in this study. In addition, the conceptual framework includes how the theories of CoPs (Lave & Wenger, 1991; Wenger, 1998) and Professional Learning Communities (PLCs) theories (Dufour & Eaker, 1998; Hord 2004; Stoll et al., 2006) inform the theoretical base of the PD model, which combines the effective features of PLC and core features of PD.

Figure 2. Conceptual and Theoretical Features of Professional Learning and Development (adapted from Desimone, 2009).



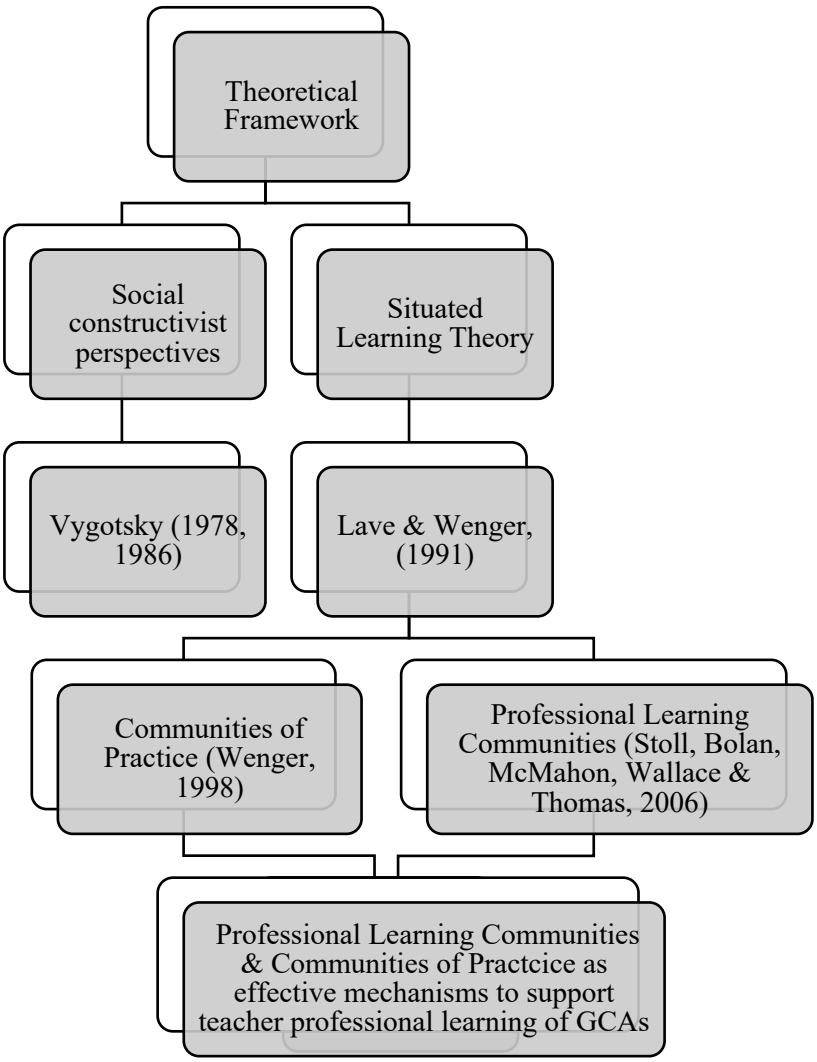
Theoretical framework

An additional source for the conceptual framework of a study is the underlying theory (Maxwell, 2013; Ravitch & Riggan, 2017). Ravitch and Riggan (2017) define theoretical frameworks as the theories, "that emerge from and have been explored using empirical work" (p. 11) and support the conceptual framework. They suggest, the theoretical framework resides within the conceptual framework, explaining the relationships examined within a study. Guided by the recommendations of Crawford (2019) and Ravitch and Riggan (2017), the study's theoretical framework is presented as an element of the overall conceptual framework. The relationships explored within the theoretical framework of this study are situated within the context of formal social constructivist and situated learning theories and how they relate to theories of Communities of Practice (CoP) and Professional Learning

Communities (PLC). Drawing on Crawford's (2019) guidelines, the theoretical framework for this study is illustrated in Figure 3, outlining the relevant 'theory cluster' pertinent to this study, along with the specific theories and theoreticians relevant to that cluster. It also identifies the selected theory related to the study and outlines its relationship to the research.

Consistent with this guide, the theoretical framework for this study identifies social constructivist perspectives on learning and situated learning theories as to the relevant 'theory clusters'. Social constructivist theorists such as Vygotsky (1978, 1986) and situated learning theorists Lave and Wenger (1991) are identified as theoreticians relevant to the given theory cluster. Theories on CoPs (Lave and Wenger, 1991, Wenger, 1998) and Professional Learning Communities (PLCs) theories (Dufour & Eaker, 1998, Hord 2004, Stoll et al., 2006) are combined, identifying the key characteristics of each and their application to professional development. Table 1 outlines the key characteristics of CoPs and PLC, their application to this study and provides Professional Development Program Examples. This framework provides a theoretical base to understand teacher learning within this context. In exploring these theories, this study will contribute to the body of knowledge related to the theory by examining the potential usefulness of CoPs and PLC as part of an effective model for professional development to support teachers learning around game-based pedagogy.

Figure 3: *Model of the theoretical framework of this study (adapted from Crawford (2019) cited in Burkholder, Cox, Crawford & Hitchcock, 2019).*



Social Constructivism

Theories on constructivism originate from the work of Piaget on cognitive constructivism. Building on these theories, Vygotsky (1978) developed a sociocultural approach to cognitive development with the development of social constructivism, emphasising the contribution of social factors to cognitive development and the benefits of working collaboratively in order to learn effectively. The social constructivist theory of Vygotsky (1978) highlights the fundamental role that social interaction, language and culture plays in learning (Fosnot, 1996). Vygotsky's theory suggests that knowledge and understanding are best advanced through interactions with others in cooperative activities (Rovegno & Dolly, 2006). Constructivism is a learning theory that is based on the premise that new knowledge is built

on prior knowledge and that optimal learning is achieved through active interaction with material rather than passive interaction (Fosnot, 1996). Elliott et al. (2000) argues "constructivism is an approach to learning that holds that people actively construct or make their own knowledge and that reality is determined by the experiences of the learner" (p. 256). Thus, constructivism is concerned with a holistic view of learning and how learning occurs from a variety of sources. From a constructivist perspective, 'cognition is seen not as an individual process but instead as a collective process spread across the individual's world' (Light, 2008, p.25).

The general principles of constructivism include, learning is an active process, learners construct knowledge in relation to their prior knowledge, knowledge is socially constructed, and deep understanding and multiple connections support learning transfer to other contexts (Rovegno & Dolly, 2006). Constructivist perspectives emphasise actively engaging the learner in the construction of knowledge and understanding (Rovegno & Dolly, 2006). Recognising that learning an active process, requiring active participation by the learner (Phillips, 1995), acknowledges the role of the learner in the teaching and learning process, giving them ownership of their learning and encouraging them to take more responsibility for selecting and engaging in tasks (Gould, 2005). An 'active' view of learning is often juxtaposed with a behaviourist 'stimulus response' view of learning, whereby the learner learns by being 'stimulated' and by 'responding' (Fox, 2001).

Social constructivism emphasises the need for collaboration among students and relationships among teachers (Lave & Wenger, 1991; McMahon, 1997, Rovegno & Dolly, 2006). Social constructivist perspectives focus on learning as a social process, recognising social interactions as a setting for learning, and acknowledging knowledge is socially constructed (Rovegno & Dolly, 2006). Much of Vygotsky's work explored the effect of social interaction, language, and culture on constructing knowledge, providing the theoretical principles for learning through social interaction (Fosnot & Perry, 2005). Constructivist perspectives recognise that knowledge is not only socially constructed, but it is rooted in culture and reflects the shared understanding of that culture (Rovegno & Dolly, 2006). Constructivist theories acknowledge the influence of prior knowledge and experiences on new knowledge constructed from new experiences (Rovegno & Dolly, 2006; Phillip, 1995). Rovegno and Dolly (2006) suggest, "cultural practices and beliefs combined with prior academic knowledge are critical pieces of information to enable a teacher to develop

instruction that is relevant, appropriate and challenging for the learner (p.245). Lastly, Rovegno and Dolly (2006) and Fosnot (1996) suggest that constructivist principles help guide teachers to develop a deep, holistic, meaningful, well-connected understanding of content in order to generalise the content to other contexts.

Constructivist learning theories are extensively employed in research concerning teacher professional learning (see: Armour & Yelling, 2004, 2007; Borko, 2004, Patton, Parker, Pratt, 2013, Rovegno, 2003). A constructivist perspective recognises the social and active aspects of teacher learning, where teachers acquire knowledge through social interactions and being actively engaged in the learning process. Constructivist theory acknowledges that teachers' prior learning and experiences can have a significant positive or negative impact on their learning. This theory encourages participants and learners to reach educational goals and acknowledge that teachers are unique with previously constructed knowledge and experiences (Rovegno & Dolly, 2006). Similarly, constructivist learning theories have become increasingly popular in Physical Education, with many authors noting the constructivist underpinnings reflected in Game Centred Approaches (see: Butler, 1996, 2006; Dyson, Griffin & Hastie, 2004; Gréhaigne, Richard, & Griffin, 2005; Kirk & Macdonald, 1998; Kirk & MacPhail, 2002; Light, 2006; Light & Fawns, 2003; Rink, 2001, Rovegno & Dolly, 2006). Although a theory of learning and not a description of teaching, constructivism has important implications for educational practices, underpinning a variety of student-centred teaching methods and techniques and informing the learning goals teachers set, instructional strategies teachers employ and the methods of assessments used (Fosnot & Perry, 2005; McLeod, 2019). Thus, constructivist theories on learning provide the theoretical foundations for this study into teacher professional learning, specifically given its context within the implementation of a constructivist pedagogical approach as pertained by GCAs.

Situated Learning Theories

Situated learning theories are derived from social constructivist perspectives of learning. For Lave and Wenger (1991), learning is a social process situated within sociocultural contexts that shape learning through participation in its practices. Situated learning theorists argue that knowledge is inseparable from the culture, contexts and activities in which it develops (Wenger, 1998). Lave and Wenger (1991) believe the primary place of learning is not the individual mind, but the processes of co-participation in Communities of Practice (CoP)

(Lave & Wenger, 1991). They explore learning as 'legitimate peripheral participation', viewing learning as an "integral part of generative social practice in the lived world" (p.35). Drawing similarities to the principles of constructivism, situated theories of learning assume that learning involves the active engagement of individuals with their environment (Rovengo, 1999; Rovegno & Kirk, 1995), where learners adapt new knowledge to fit to what they already know (Prawat, 1999). Learning occurs through practice and the social interaction that arises from it. Thus, social and cultural contexts contribute to and influence what is learned and how learning takes place (Lave & Wenger 1991), providing a more holistic view of learning (Griffin, Brooker & Patton, 2005).

Viewing learning in the mode of 'legitimate peripheral participation' acknowledges that learners inevitably participate in communities of practitioners (Lave & Wenger, 1991), where new learners are engaged through the process of becoming a full participant (Altrichter, 2005). Hanks (1991) suggests that 'legitimate peripheral participation' denotes the mode of engagement of a learner who participates in the actual practice with an expert. Griffin, Brooker and Patton (2005) suggest legitimate peripheral participation refers to the "participation that occurs within sets of relationships in which 'newcomers' can move toward 'full participation' by being involved in particular experience or practice and this develops new sets of relationships" (p.219).

Altrichter (2005) describes the three 'building blocks' to learning within 'legitimate peripheral participation'. These blocks are listed as;

- Participation in a practice is necessary for learning.
- Peripherícality: learners must be allowed to temporarily play a peripheral role, a position that is partly dispensed from the pressure of immediate practical action and enables a stance of cognitive and emotional distance. As their learning progresses their involvement gradually increases, and more central roles are taken up.
- Access to the field of practice and peripherícality must be legitimised in the specific community in order that learning may unfold (p.16).

Of particular significance to this study is the research into teacher learning using situated perspectives. Specifically those that have been grounded in the concepts of Communities of

Practice (CoP) and the situated nature of knowledge (see Butler, Lauscher, Jarvis-Selinger, & Beckingham, 2004; Ennis, Ross & Chen, 1992; Macdonald, Kirk & Braiuka, 1999; Parker, Patton & Tannehill, 2012; Rolfe, 2001; Rovengo, 1992, 1994). Parker, Patton and Tannehill (2012) suggest "Situated learning perspectives provide a meaningful framework for examining teacher learning and the facilitation of PD" (p.312), thus providing an excellent theory base for this study. Research in the PE field argues that constructivist and situated learning theories often associated with student-centred learning such as GCAs, have the potential to contribute to new theoretical perspectives on learning in the physical domain and can generate new theoretical perspectives (Griffin, Brooker & Patton; 2005; Kirk, 2003; Kirk & McDonald, 1998; Kirk & McPhail, 2002).

The theoretical framework for this study proposes that theories of CoPs (Lave & Wenger, 1991) and PLCs (Dufour & Eaker, 1998, Hord, 2004, Stoll et al., 2006) are grounded in the theoretical underpinnings of social constructivism and situated learning, providing a framework for the suggestion that CoPs and PLCs are effective mechanisms for learning. It is for this reason that theories on CoPs and PLCs provide a theoretical and conceptual base for this research and informs the professional development model developed as part of this study.

Communities of Practice

The theoretical framework for this study posits CoPs share a theory base with situated learning and the broader constructivist lens. The basic premise of CoPs is that learning is a social process. It takes place in the communities we are part of, "it is distributed among co-participants, not a one-person act" (Lave & Wenger 1991, p.15). The term 'Communities of Practice' was first coined by Lave and Wenger (1991), who used it to describe the situated learning associated with apprentices in professional communities. Building on this theory, Wenger, McDermott and Snyder (2002), redefined CoPs as, "Groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis (p. 4). Wenger (1998 & 2002) further expanded on this notion of Communities of Practice, suggesting they "hold the key to real transformation – the kind that has real effects on people's lives" (Wenger, 1998, P.85). Whilst Wenger, McDermott and Snyder (2002) believe in the values of Communities of Practice, they acknowledge some of the disadvantages, highlighting problems associated with the hoarding of knowledge, clique formation, limitation of innovation, and exclusiveness regarding membership.

Wenger (1998) has taken the concept of CoPs and extended it into a comprehensive theory of how organisations and individuals within organisations work together. CoPs theory can be applied to both "intra" or "inter" organisational settings, describing it as "existing everywhere" and an "an integral part of our daily lives" (p. 6,7). In his book, 'Communities of practice: Learning, meaning and identity', Wenger (1998) presents CoPs alongside a theory of learning. The theory explores the connection of four learning components: 1. Community, 2. Practice, 3. Meaning and 4. Identity. The concept of community is associated with learning as belonging and being accountable to that community. Practice explores learning as doing, being actively engaged in the process, along with meaning which explains learning as experience. Identity is associated with learning as becoming, where the learner is a social participant in the learning process. The learner is a 'meaning-maker' or a 'knower' within the context of the community. Wenger (1998) considers how these components can provide a conceptual framework for analysing learning as social participation, in which CoPs clearly involve all four components of learning that are interconnected and mutually defining (p.13).

CoPs are based on the belief that a group of people who share a concern in a field of interest will engage in social learning practice to advance the knowledge and understanding of that fields and in so doing develop community bonds (Wenger et al. 2002). CoPs operate as 'social learning systems' (Snyder, Wenger & De Sousa Briggs, 2003). Lave and Wenger (1991) emphasise the importance of shifting the analytic focus from the individual as the learner to learning as participation in the social world. Similarly, Hanks (1991) stresses that, learning in Community of Practice is "meditated by the differences of perspective among the CoPs participants. It is the community, or at least those participating in the learning context, who 'learn' under this definition" (p.15). For a Community of Practice to exist, Wenger (1998) suggests there should be a triangulation of three essential components:

I. domain of shared interest or joint enterprise,
II. community which is indicated by 'mutual engagement' in and around the domain of interest, and
III. practice as a 'shared repertoire' or resources that have been developed over a period of time.

Community members of the CoP share a 'domain of interest' or common goal and collectively pursue that interest. The 'shared practice' usually evolves over time through

sustained interaction and the development of shared knowledge, skills, discourses, and resources (Lave & Wenger, 1991; Parker, Patton & Tannehill, 2012). Participation in a CoP is usually voluntary, where membership can either be self-selected or assigned by the organisation; based on expertise or passion for a topic; Leadership is mostly distributed; coming from both formal and informal leaders, within and outside the community (Blankenship & Ruona, 2007).

Communities of Practice in Education

In an educational setting, the CoP model has been used to explore teacher learning and PD (see: Barab & Duffy, 2000; DuFour & Eaker, 1998, Dufour, 2004; Hodkinson & Hodkinson, 2003; Lave, 1996; Little, 1990). Koliba and Gajda (2009) reference CoPs as an "integral component of a structured intervention for organisational change and professional development" (p. 100). Significantly, PD research suggests that the capacity to create 'community' is a critical feature of any successful professional learning models (Cobb, McClain, Lamberg, & Dean, 2003; Franke & Kazemi, 2001). It is believed that professional learning in such community builds an atmosphere of participation, social negotiation, and collective learning (Clark & Borko, 2004). Researching in the school setting, DuFour and Eaker (1998) suggest CoPs allow a more authentic learning experience for teachers. Linking Lave and Wenger's (1991) ideas about CoPs to teacher learning, Hodkinson and Hodkinson's (2002) research with secondary teachers found that where departments were close-knit, social practice was important to learning and that teachers learned through 'legitimate peripheral participation' (Lave & Wenger, 1991). Wilson and Powell's (2013) case study within an Australian context explores the collaboration of researchers, teachers, and students to create learning experiences that reflect quality teaching. In their findings, Wilson and Powell (2013) highlight the importance of CoPs and supportive leadership structures in offering schools the opportunity to "engage with each other in collaborative communities committed to shared goals, shared responsibility, shared leadership and the continuing commitment to improving teacher practice and ultimately, student learning" (p. 46).

It is believed that a teaching professional's CoP can have a direct (positive or negative) impact on professional growth through various forms of informal collegial interactions, fostering teacher learning and instructional improvement (Barab & Duffy, 2000, Borko, 2004). It is for this reason that CoPs theory was used to provide a theoretical base to this study and has helped inform the PD process used to support the teachers' implementation of

games-based pedagogy.

Professional Learning Communities

In connecting CoP theory to teacher learning, professional development and improving teacher practice, this study makes direct links to 'Professional Learning Communities' (PLC's). Dufour and Eaker (1998) define a PLC as "educators [creating] an environment that fosters mutual cooperation, emotional support, and personal growth as they work together to achieve what they cannot accomplish alone" (p. xii). Others have identified PLCs as a group of like-minded teachers that work collectively to improve their teaching practice, for the purpose of improving learning (Hargreaves & Fink, 2006; Timperley, 2008). Hord (1997) used the term 'communities of continuous inquiry and improvement' (p.1); identifying the main goals of PLCs is to enhance the effectiveness of teachers and administrators in schools for the benefit of the students. PLCs are more explicitly linked to teacher learning, school improvement and student achievement and as such, provide a more comprehensive framework for this study. Dufour and Eaker (1998) suggest that PLCs provide a framework from which a school faculty can begin to shift the culture of their school in order to build capacity for implementing and sustaining change.

Similarly, Borko (2004) argues that professional learning communities are central to fostering teacher change and student learning. Developing PLC holds considerable promise for capacity building for sustainable improvement (Stoll et al., 2006). Participating in professional learning communities provides teachers with an opportunity to look deeply into the teaching and learning process and to learn how to become more effective in their work with students (Morrissey, 2000).

In reviewing the PLC literature, Stoll et al. (2006) link the concept of PLC to the work of Stenhouse (1975) advocating the 'teacher as a researcher' movement, believing teachers should play an active part in the curriculum development process; along with the work of Schön (1983, 1991) promoting the notion of the 'reflective practitioner'. Similar to CoPs, PLCs shift the focus from individual teachers' professional learning to professional learning within a community context, emphasising a 'professionally collaborative culture' (Fullan, 2001), where the focus is on a community of learners and collective learning (Stoll et al., 2006).

Education authorities have adopted PLCs in Australia. The Australian Institute for Teaching and School Leadership (AITSL) suggest a PLC in schools involves "collaboration, sharing and ongoing critical interrogation of teaching practices in line with professional standards" (AITSL, Nd). AITSL recognises the value of collaboration through professional learning communities, suggesting collaboration promotes change beyond individual classrooms, resulting in whole-school improvement; when educators increase their expertise by learning together, all students benefit (AITSL, Nd). Similarly, the NSW, Department of Education and Communities (2015) advocate that effective professional learning opportunities include learning communities, promoting collaboration, where professional learning communities within and between schools are developed.

Much of the research has set about identifying the main characteristics that constitute effective PLC. According to Dufour and Eaker (1998), PLCs share six common characteristics, which include, 1) shared mission, vision, and values, i) collective inquiry, iii) collaborative teams, iv) action orientation and experimentation, v) continuous vi) improvement and results orientation. Later, Hord (2004) refined these to five dimensions. These included, supportive and shared leadership, shared values and vision, collective learning and application of learning, supportive conditions, and shared practice. Dufour and Eaker (1998) emphasise the importance of the roles the principal, parents, and community play in establishing the learning community, as well as changes in the curricular focus of the school. Hord (2002) emphasised the need for reflective dialogue as a vehicle for collective learning and supportive conditions, to enable collective learning and shared practice. Similarities can be drawn between the PLC characteristics identified by Dufour and Eaker's (1998) and Hord (2004), where both identify the cultural shift that must occur if schools intend to become learning communities. In their later summary of the PLC literature, Stoll et al. (2006) further refine these PLC characteristics, suggesting they include:

I. **Shared values and vision** – having a shared goal or sense of purpose with a focus on student learning, e.g. entire staff's shared values and vision about learning (Stoll at al., 2006).
II. **Collective responsibility** – members of the PLC take collective responsibility for student learning, helping to sustain engagement and commitment within the PLC, e.g. staff sharing a sense of responsibility for pupil learning (Stoll et al., 2006).
III. **Reflective professional inquiry** – reflective dialogue about educational issues,

examining teaching practice through mutual observation, e.g. schools collecting data and monitoring student progress (Stoll et al., 2006).

IV. **Collaboration** – PLC members working together to develop activities, interdependence within the community, e.g. staff's collaboration in activities focused on pupil learning (Stoll et al., 2006).

V. **Group, as well as individual, learning is promoted** – Collective learning with colleagues, e.g. PLC members engage in planned and informal professional learning, both individual and collective (Stoll et al., 2006).

In later research, Fullan (2007) outlined similar critical elements of a PLC which are essential for PLCs to exist. These include "reflective dialogue, derivatisation of practice, collective focuses on student learning, collaboration, and shared norms and values" (p. 148-149). Manly parallels can be drawn with Fullan's (2007) features of PLCs and Stoll et al. (2006). Fullan (2007) also stressed that structural components such as "time to meet, physical proximity, interdependent teaching roles, communication structures, and teacher empowerment and school autonomy" (p.149) and cultural components such "openness to improvement, trust and respect, cognitive and skill base, supportive leadership, and socialization (of staff)" (p. 149) are important.

Given the extensive research into the potential PLCs have for supporting teacher professional development and improving teacher practice, developing a PLC was a central feature of the PD model posited in this study. The five PLC characteristics espoused by Stoll et al. (2006) informed the characteristics deemed necessary when developing the PLC as part of this study, providing a theoretical base to guide the PLC formed as part of the PD model posited. A discussion of how these are applied is provided below when exploring the application of the theoretical framework.

Applying the theoretical frameworks

Informed by the CoP and PLC research, the term 'Professional Learning Community' (PLC) has been used in this study. In this setting, the PLC is comprised of the group of educators and the environment created for the purpose of this research. The group of educators included the four teachers within the PDHPE faculty, the lead researcher, school executive and an expert panel of university academics, situated within the context of one secondary school.

In providing a theoretical framework for this study and a theoretical base for the model of PD posited, this study has drawn on both constructivist and situated theories of learning as the theory cluster that informs the specific theories of CoPs and PLCs. It is believed that these theories provide a theoretical base for understanding the social and active learning that takes place in these environments, acknowledging that teachers do not come to the learning contexts as a blank slate, that there is a range of cultural and contextual things that impact their learning. In identifying the specific theories that provide the theoretical base within this study, the work of Wenger (1998) concerning CoPs and Stoll et al.'s (2006) work with PLCs has been combined to provide an amalgamation of the essential characteristics of PLCs. Thereby, this research provides a comprehensive theoretical framework that has explored the connections between both the CoP and PLC theory, acknowledging their links to constructivism and situated learning, providing the theoretical underpinnings for this study. The key features of CoPs and PLCs and their application to this study is summarised in Table 1 below.

Table 1. Key characteristics of CoPs and PLC and their application to this study

Community of Practice (Wenger, 1998)	Professional Learning Community (Stoll et al., 2006)	Definition	Professional Development Program Examples
Core Feature	Core Feature		
Domain of shared interest or joint enterprise.	Shared values and vision.	Participants have a common educational goal for engaging in professional learning.	A common desire to transform practice and adopt a similar pedagogical approach (e.g. GCAs) to improve student learning.
Community which is indicated by 'mutual engagement' in and around the domain of interest.	Collective responsibility. Group, as well as individual, learning is promoted.	Each participant is continuously involved throughout the professional learning program and is responsible for their actions for both themselves and the group within the educational process.	Participating teachers engaging in the professional learning with other supportive members (e.g. expert panel). Work collaboratively to design and develop unit and lesson materials. Learning aligned with the group and individual needs of participants.
Practice as a 'shared repertoire' or resources that have been developed over a period.	Collaboration. Group, as well as individual, learning is promoted. Reflective professional inquiry.	Participants work together to share and develop ideas, lessons and resources that facilitate the learning process of the program.	Development of game-centred practice, jointly developed teaching tools, unit plans, lesson plans, assessments and resources, as a result of the professional development activities. Continuous reflection by each participant through individual and group activities such as a journal or researcher led conversations.

In exploring the connections between the CoP (Wenger, 1998) and PLC characteristic outlined by Stoll et al. (2006), this study assumed that the 'shared values and vision' characteristic shares similar notions with the CoP 'domain or shared interest', where all members of the PLC share the same desire to learn and transform their teacher practice by adopting GCAs. Given the teachers' voluntary commitment to participate in this study and the needs-based nature of the PD, it was assumed that as members of the PLC, all teachers shared this vision and the associated values. In doing so, there is an "unwavering focus on student learning" (Morrisey, 2000, p.5) and improving student learning outcomes in Physical Education. In this setting, a shared value base provides a framework for 'shared, collective, ethical decision making' (Louis, Kruse & Bryk, 1995).

In PLCs, all members take collective responsibility for student learning which draws parallels to CoP's feature of 'mutual engagement'. The community indicated by 'mutual engagement', refers to the participating PE teachers engaging in the PD, the researcher and the panel of experts, working collaboratively to facilitate change to their teaching practice. Hord (1997) suggests that "in such a community the individual staff member is responsible for his/her actions, but the common good is placed on a par with personal ambition" (p.20). In PLCs, all members are collectively responsible for their professional learning and transforming their teaching practice. The notion of collective responsibility helps to sustain commitment, puts peer pressure and accountability on those who do not do their fair share, and eases isolation (Newmann & Wehlage, 1995, Stoll et al., 2006). PLCs engage school staff at all levels in processes that collectively seek new knowledge and ways of applying that knowledge to their work. The collegial relationships that result produce creative and appropriate solutions to problems, strengthening the bond between principal and teachers and increasing their commitment to improvement efforts. In this study, it was intended that all PLC members take collective responsibly for their individual and collective learning (Stoll, McMahon & Thomas, 2006), where the teachers would be mutually engaged in transforming their pedagogy to adopt GCAs into their practice (Wenger, 1998).

Collaboration refers to the involvement of all PLC members in the PD activities, for example, joint review and feedback (Hord, 2004), going beyond superficial exchanges of help, support, or assistance (Louis et al., 1995). Collaboration in PLCs shares similarities with the CoP's 'shared repertoire', where all members of the PLC work as a team to implement game-centred practice, jointly developing teaching tools, unit plans, lesson plans, assessments and

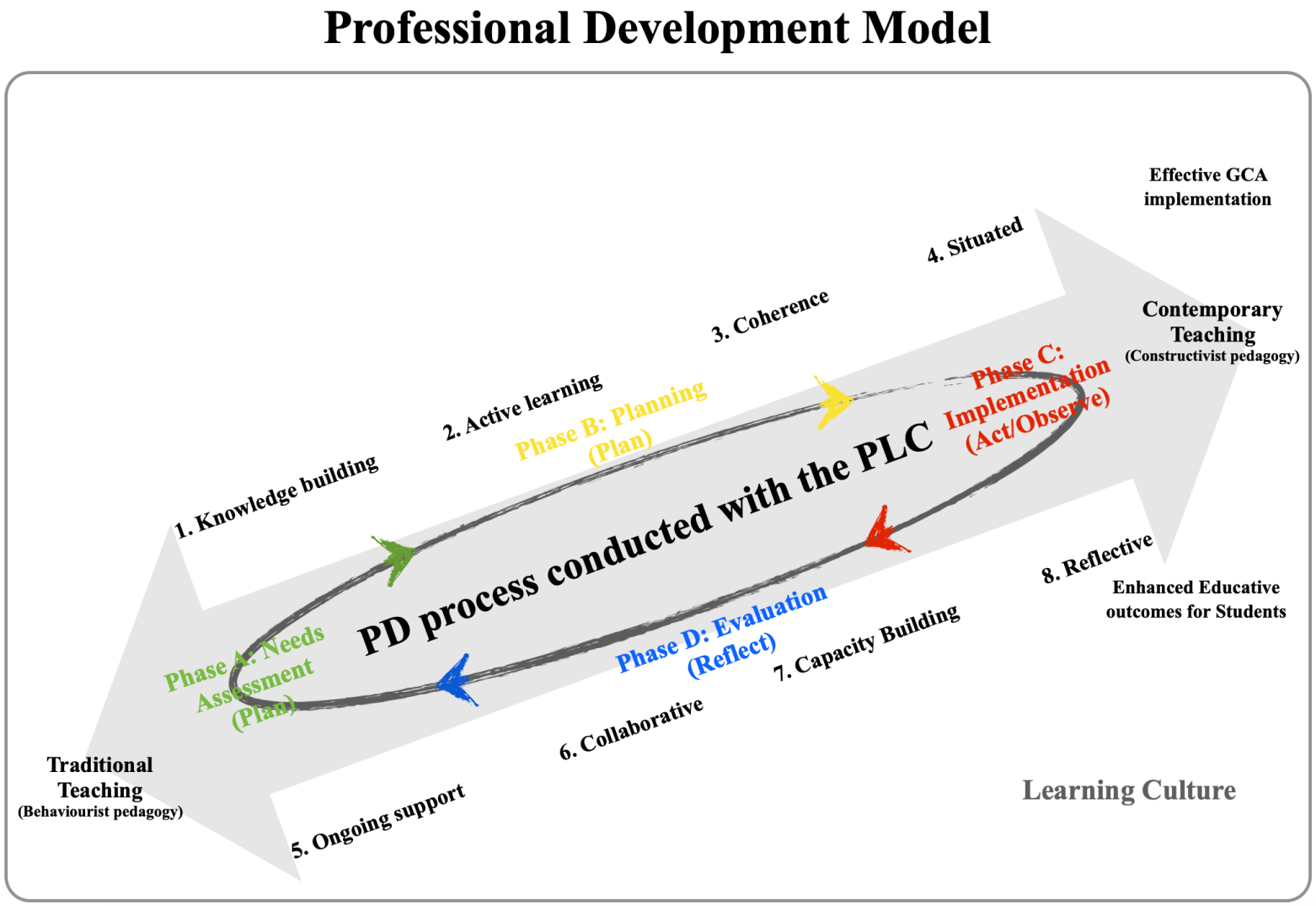
resources, as a result of the PD activity. Linked to collaboration and a 'shared repertoire', PLC theory also identifies that group, as well as individual, learning should be promoted. All teachers are learners with their colleagues (Louis et al., 1995). Here all members of the PLC are learning and improving their practice together, individually and collectively.

'Reflective professional inquiry' is distinctive to PLCs, although is expected as part of the collaborative practice of PLC members. Thus, this element aligns with the CoPs feature of 'mutual engagement' given the association with being part of the learning process. As part of the collaborative practice, this feature includes 'reflective dialogue' (Louis et al., 1995) between the teachers and researcher about the implementation of the games-based pedagogy, any problems in applying the knowledge of GCAs to practice, both reviewing performance and informing futures practice. This is a key component of the PD process and encouraged both individually and collaboratively after each lesson. Deprivatization of practice (Louis et al., 1995, Fullan, 2007) is achieved through mutually observing and examining the teachers' practice and collaboratively planning the teaching resources. Fullan (2001) suggests that this converts tacit knowledge into shared knowledge through interaction.

Designing of the Professional Development Model

As part of this thesis, a real-world professional development program was designed and implemented. A review of the professional development literature and research illustrated a strong association between the key features of effective professional development espoused by Desimone (2009) and the frameworks of CoP and PLC. Inherently, these features of PD were also in line with the constructivist and situated learning approaches. The model of PD developed and implemented within this study is illustrated in Figure 4.

Figure 4. Proposed model of Professional Development



The PD model was designed in congruence with the characteristics of effective PD identified in the literature. Theories of PLCs, CoPs, social constructivist and situated learning theories are identified in characteristics such as active learning, situated learning, collaborative and reflective practice. As such, these eight PD components were identified as being central to the PD process, facilitating and supporting a culture of learning. The eight PD components embedded in the PD process included:

1. Knowledge building
2. Active learning
3. Coherence
4. Situated
5. Ongoing Support
6. Collaborative practice
7. Capacity building
8. Reflective practice

Knowledge building

As Desimone (2009) argued, developing teachers' knowledge of subject matter content and how students learn is a key feature of PD. Being able to translate knowledge into practice to benefit students' learning was a key goal within this study. As such, building teachers knowledge of GCAs and how to teach using games-based pedagogy was a fundamental component of the PD process. This study focused on developing the teachers' PCK associated with the GCAs, specifically the instructional processes associated with implementation. Specific GCA benchmark elements were used as a lens through which to view and measure the teachers' knowledge. These benchmark elements are provided in more detail in Chapter 4. The initial needs assessment in Phase A was instrumental in identifying the teachers' baseline knowledge as a prerequisite for the PD, and this information was used to build the teachers knowledge.

Active learning

To ensure that the participating teachers were 'active learners' and that they were actively engaged in their own learning, the teachers were encouraged to play a key role in the PD process, identifying their own needs and selecting learning initiatives that would best support their learning. The PD was designed with opportunities for active participation in the learning

process and for sharing ideas, knowledge and experiences within the PLC. As guided by Garet et al. (2001), the teachers allowed to observe the lead researcher deliver GCA lessons and were also observed teaching their GCA lessons. Planning was a collaborative process, and learning activities were conducted within the teachers' setting, with their students and resources. The teachers were encouraged to reflect on their practice and identify what they needed to support them in being successful in implementing GCAs effectively. This situated and collaborative practice supports the notion that the PD was applicable and relevant.

Coherence

The situated nature of the PD program ensured that the PD provided was relevant and applicable to the teachers' individual needs, including their setting and context. Coulter and Woods (2015) recommend that PD needs to be individualised to each teachers' learning needs. In this model of PD, the needs assessment phase allowed the researcher to gain insight into the teachers' existing knowledge and beliefs about teaching and learning in Physical Education, identifying their individual needs and starting point. This needs assessment was vital in ensuring that the PD process was aligned to the teachers own learning goals and individual needs. Guided by the research of Armour and Yelling (2004), the researcher played a key role in challenging the teachers' beliefs and thoughts about teaching and learning in PE, providing them with 'ideas' and 'practices' that they could use in their lessons. In this way, the PD provided experiences consistent with the teachers' learning goals and the overall aim of the research study.

Situated

As situated approaches to learning remind us, understanding the context in which learning takes place is essential in understanding how and whether any particular form of PD can be regarded as 'effective'. The PD in this setting needed to be situated within the environment in which the teaching and learning would be taking place. As such, the PD provided ongoing support throughout the implementation of the unit. The PD was delivered on site, using the teachers and their classes in their environment and using their facilities and resources. The researcher situated herself in the context of the teaching and learning to gain an understanding of the environment and learning culture in which learning was taking place and how best to support the teachers learning. The situated and contextualised nature of the PD allowed the researcher to understand and respond to any contextual issues that arose. For

example, the class size was reduced affecting the games designed. Learning in this context occurred through the practice and social interaction of the teachers, researcher and the expert body. The initial and ongoing needs assessment throughout the PD process allowed the teachers initial and developing knowledge and understanding of GCAs, along with the disparity of knowledge between the teachers to be considered, and the PD adapted accordingly. Thus, the needs-assessment allowed the PD to be contextualised and personalised to the teachers setting.

Ongoing Support

Whilst there is much ambiguity around the optimal length of time for PD (Coulter & Woods, 2012), the importance for ongoing and continuous PD in changing teaching practices and learning outcomes is stressed within the literature. Establishing a PLC as part of the PD process provided a context for the teachers' ongoing and continuous learning. In this setting, unlike the one-day, one-off PD opportunities reported as being ineffective in the literature (see Armour & Makopoulou, 2011; Armour & Yelling, 2004; Armour & Yelling, 2007; Casey, 2012); the PD spanned the duration of the unit of work. The teachers were provided with ongoing support for their learning throughout their implementation of the designed unit, where the researcher and the expert body were able to provide follow up support. The situated nature of the PD allowed the professional learning to be embedded into the daily routine of teachers, providing a platform for ongoing and further learning.

Collaborative practice

CoPs and PLC theories recognise the value of working collaboratively to learn. Similarly, the PD literature advocates that effective PD allows time for collaboration and collective participation. As such, establishing a PLC where all participants collaborated to achieve the shared goal of transforming their teaching practice to improve student learning outcomes was imperative for this study. Opportunities for collaboration and collaborative practice were built into the PD process. To build upon the collective previous knowledge and experience, using the combined strengths of each person in the PLC, the teachers were presented with the opportunity to collaborate in their unit and lesson planning, along with their reflection and evaluation. It was hoped that learning in this environment would enable the teachers to construct knowledge through social interaction and build solid relationships based on obligation and trust (Armour & Yelling, 2007).

Furthermore, Armour and Yelling (2007) note that teachers highly regard links with universities and suggest "including support from sources external to the school that can provide necessary resources and outside perspectives" (Armour & Yelling, 2004, P.82). As such, links with the expert body, which included University lecturers were forged. The 'expert body' provided feedback on the teachers' units and lesson plans, as well as their teaching practice. The researcher acted as the link between the teachers and the 'experts' and was actively engaged in the collaborative process.

Capacity building

Building the teachers capacity to learn and helping them to become active learners was a key component of the PD process, as guided by the literature (see: Armour & Makopoulou, 2011; Tripp, 2004; Claxton, 2002). The model of PD was designed to build capacity by being teacher-centred, where the teachers were given a voice and empowered to direct their own learning. The initial needs assessment enabled the PD to be personalised and tailored to the individual teacher's needs. Each phase of the PD required the teachers learning to be monitored, and their needs reassessed. Teachers identified their own needs and how best to support their learning needs with the guidance of the researcher and the expert panel.

Reflective Practice

Reflection is seen as being fundamental to success in facilitating learning (Rodgers, 2002) and plays a vital role in teachers' professional development (Mathew, Mathew & Peechattu, 2017). As such, reflection was a key part of each phase when using the AR cycle. Similarly, reflection and reflective practice was a significant component in the PD process. The teachers were encouraged to reflect on their teaching practice and implementation of each lesson using a Post Teaching Reflective Analysis (PTRA) (Dyson 1994) (see Appendix 4 for sample document). As part of the AR process within each phase, the teacher participants were expected to reflect on the PD and their learning needs, ensuring they were supported through the PD process. In this way, both the teachers' practice, and the PD process was developed and refined to support their learning. As such, the PD process was informed by the teachers' reflections.

Professional Development Phases

Each phase of the PD process served a specific purpose in facilitating the teachers learning and supporting them in implementing GCAs. Each phase required the teachers and the researcher to complete a series of tasks. The intention of each phase and a sample of activities is included below.

The four PD phases included:

- Phase A: Needs Assessment (Plan)
- Phase B: Planning (Plan)
- Phase C: Implementing (Act/Observe)
- Phase D: Evaluation (Reflect)

Phase A: Needs Assessment

The purpose of the needs assessment in Phase A was to measure and evaluate the individual needs of the teachers' and their initial knowledge and understanding of GCAs. Information obtained in Phase A was used to establish a starting point for the PD process. This phase allowed the researcher to assess the teachers' current knowledge and gain insight into current teaching practice. The initial needs assessment involved an information session with the researcher where the participant teachers were provided with an overview of the research proposal, information letters and consent and background information on GCAs. This phase also involved several focus group interviews to establish the research framework and the PD process, along with working out timeframes and timelines for the research, PD implementation and teaching unit (see Table 2).

Phase B: Planning

Phase B involved the teachers in planning and designing a GCA unit of work with the aim to complete activities collaboratively. All teachers and the lead researcher had input and worked together in designing the learning sequence and learning activities for their students. These materials (e.g. unit plan) were presented to a panel of experts by the researcher for feedback before planning the individual lesson plans. Following the initial unit design, the teachers were then required to plan related lessons and authentic assessment. The decision was made to do this weekly where the feedback and reflection from one lesson would help inform subsequent lessons. The teachers aimed to plan the lessons collaboratively, then individualise the lesson and apply it to their chosen teaching context. The researcher and the expert body

provided the teachers with feedback on their lesson plans and subsequent implementation, to inform and improve their delivery of the next lesson.

The researcher introduced the teachers to the Games Performance Assessment Instrument (GPAI) (Oslin, Mitchell and Griffin (1998) and the Team Sport Assessment Procedure (TSAP) (Gréhaigne, Richard & Griffin; 2005) as a means of supporting their planning and implementation of authentic assessment in this setting. The researcher provided the teachers with several examples including peer assessment, self-assessment and teacher assessment showing how they could assess game performance behaviours such as tactical understanding, as well as the player's ability to tactical solve problems by selecting and applying the appropriate skills. Many studies have used the GPAI to assess game performance (see Casey & Dyson, 2009; Memmert, 2010; Memmert & Harvey, 2008, 2010) and the TSAP to measure game ability (see: Arias & Castejón, 2012; Gréhaigne et al., 1997; Nadeau, Godbout & Richard, 2008a, 2008b). The teachers were then encouraged to select and adapt the sample assessment for their context.

Phase C: Implementation

The implementation phase included the lesson and assessment delivery. The teachers individually delivered their planned lesson within their chosen application activity, with their own class. The researcher observed the lesson to provide feedback to the teachers on their implementation and fidelity to the GCAs. The lessons were also recorded to enable to expert body to observe the lesson later, provide additional feedback, and ensure the researcher was making a fair judgment using the observational tool.

Phase D: Evaluation

The evaluation phase involved the teachers individually reflecting on the lesson and being provided with feedback from the researcher and the expert body concerning their implementation and fidelity to the GCAs. The teachers were engaged in a focus group where their lesson feedback was provided, and subsequent implementation support was discussed and facilitated. The final evaluation phase included an evaluation of the overall PD process, where a focus group interview was used to provide relevant data to support the research questions.

The primary learning activities and learning outcomes of these four phases are listed below and included in Table 2.

- **Planning:** a) establish a knowledge and understanding baseline for learning (Phase A – Needs-assessment),
  b) develop a GCA unit overview, and lesson plans to be delivered to students, developing authentic assessment (Phase B – Planning)
- **Acting:** implement the GCAs unit/lessons plans (Phase C – Implementing)
- **Observing:** observe and document the effects of the Unit and lessons (Phase C – Implementing and Phase D – Evaluation)
- **Reflecting:** reflect on the effects of the unit and lessons for further planning and informed action (Phase D – Evaluation)

The Action Research Process

The cyclical plan, act, observe and reflect Action Research (AR) process was ongoing throughout each phase of the PD. As such, each phase of the research was informed by the reported experiences and findings of the previous phase. Consequently, the PD model was developed and revised throughout the study, guided by the teacher participants' engagement in the continuous process of planning, acting, observing and reflecting (Kemmis & McTaggart, 1988). The teachers' and researcher's actions and learning were monitored through the AR process throughout each phase of the PD process. The findings from each phase helped inform the subsequent PD. Both the researcher and the teachers were engaged in the continuous practice of reflection and adaptation. This cyclical AR process was ongoing throughout each of the four phases of the PD model, that is, Phase A – the needs assessment, Phase B – planning, Phase C – implementation and Phase D – Evaluation and lasted the duration of the study. Throughout the AR process, the teachers' actions and learning were monitored, guiding and informing the PD process where and the PD was subsequently tailored to the teachers' individual needs.

Table 2. Main learning activities and learning outcomes across the four PD phases

Phase	Purpose	Tasks	Timeframe
Phase A: Needs Assessment	Establish a starting point for the GCA PD	• Enquire into prior experience • Identify current practice • Establish a starting point for the PD • Personalise PD	**Term 1, 2014** Tuesday, 29 January to Friday, 11 April Week 4 – Week 11 (17th March – 11th April)
Phase B: Planning	Design GCA unit overview, lesson plans and assessment	• Collaboratively plan overview, lesson plans & assessment (GPAI) • Sharing ideas and experiences • Revise planning	**Term 2, 2014** Monday, 28 April to Friday, 27 June Week 1 -3 (28th April – 16th May)
Phase C: Implementation	Deliver GCA unit overview, lesson plans and assessment	• Teach GCA lessons • Observe practice (Using observational benchmark tool)	**Term 2, 2014** Monday, 29 April to Friday, 27 June Week 4 – Week 7 (20th May – 13th June)
Phase D: Evaluation	Reflect on GCA delivery and inform planning	• Critical reflection of GCA delivery • Feedback on lesson observations • Sharing ideas/practice • Inform next cycle of planning/lesson	**Term 2, 2014** Monday, 29 April to Friday, 27 June Week 8 (16th May – 20th June)

Chapter Conclusion

The theoretical framework used in this study brings together constructivist theories of learning, including situated learning and theories of 'community of practice', providing a starting point for the research problem and establishing a vision to which the problem is directed. The theoretical framework is detailed in this chapter, showing how it helped to shape the research process and the model of PD to be used. The conceptual framework adopted for this research draws on Desimone's (2009) core conceptual framework for studying teachers' PD, identifying a set of critical features that define effective professional development and the operational theory of how PD works to influence teacher and student outcomes.

Chapter 4

RESEARCH METHODOLOGY

Introduction

The methodology chapter outlines the process of research for this study, which includes the research aims and questions, study design, study context and procedures for data collection and analysis. The tools and materials used, ethical considerations and trustworthiness are also outlined in this chapter. Rationales and justifications for the qualitative methods and methodological selections are provided throughout this chapter to support the choices made throughout this research study.

Research aim and questions

Research aim

Qualitative research begins with an issue or a problem that needs to be solved (Creswell, 2013). For instance, an issue within the broader educational context is understanding ways to effectively and efficiently support the professional learning of educators. As such, the purpose of this study was to understand the professional learning needs of teachers when implementing Game Centered Approaches (GCAs) to identify influential elements of a conceptually grounded model of Professional Development (PD).

Research questions

The research question helps illustrate the core purpose of the study; as Creswell (2013) indicates qualitative research questions intend to narrow the purpose of the study. The research question(s) should be "formulated in such a way that (in the context of the planned study and using the available resources) they are capable of being answered" (Flick, 2009, p. 129). Agee (2009) suggested, "qualitative inquiries involve asking the kinds of questions that focus on the why and how of human interactions" (p.423). Subsequently, qualitative research questions should articulate what a researcher wants to know about the intentions and perspectives of those involved in social interactions (Agee, 2009). Agee (2009) asserts a "single overarching question allows a researcher to capture the basic goals of the study in one major question", giving "direction for the study design and collection of data and offer

potential for developing new, more specific questions during data collection and analysis" (p.435). Therefore, the major overarching question that guided this study was:

> What are PE teachers' experiences of and responses to a professional development model designed to support their implementation of GCAs?

From this broad overarching question, the following secondary research questions were created to guide the research.

1. What barriers and facilitators impact on teacher professional learning when implementing GCAs?
2. What elements of games-based pedagogy do teachers need support with when learning to teach GCAs?
3. What are the characteristics of effective GCA-PD?

Qualitative inquiry

Given this research focused on an educational context, studying teacher participants within their own environment, and considering the complexities that arise from such research, a qualitative approach to inquiry was adopted. Qualitative methods of inquiry were developed in the social sciences to enable researchers to study social and cultural phenomena (Aliyu, 2015). Qualitative forms of research recognise the importance of the "subjective, experiential 'lifeworld' of human beings" and can lead to the discovery of deeper levels of meaning (Burns, 2000, p. 11). Unlike quantitative research, "'truth' within this context is bound to humanistic caprices" (Burns, 2000, p.11). Qualitative research allows for relationships to be drawn and cause and effect to be suggested and the dynamic processes within school settings to be considered (Burns, 2000). Qualitative research is generally used when there is a problem or issue that needs to be explored (Creswell, 2013). As such, how to best support teachers to implement GCAs was the problem explored in this context.

Philosophical assumptions

Qualitative researchers must identify the philosophical assumptions within their research (Creswell, 2013) since they shape how the research problem and question is formulated and how the researcher seeks to answer it (Huff, 2009). Denzin and Lincoln (2000) argue that the philosophical assumptions relevant to the research philosophy include, being (ontology); knowing (epistemology) and acting (axiology). Recognising the ontological and

epistemological orientation within the research paradigm helps to determine the course of the researcher's project (Hussey & Hussey, 1997). As such, this study takes on the philosophical assumptions made by researchers when undertaking a qualitative study regarding ontology, epistemology, axiology, and methodology, clearly stating these assumptions within the context of this study for the reader.

Ontology

Ontology relates to what the research is looking at, "the kind of events that exist in the social world" (Thomas, 2009, p.87), it questions the form and nature of reality (Guba & Lincoln, 1994). The ontological beliefs of qualitative research embrace the idea of multiple realities (Creswell, 2013). In the case of this study the 'nature of reality' was multiple since it was seen through the views of the different teacher participants reported within the multiple forms of evidence, presented by the researcher as the themes developed in the findings. A social constructivist framework was adopted to interpret the results, whereby the researcher gathered the participants' views and reported them as evidence, using the participants own words to illustrate the findings. The researcher explored the complexity between these views before synthesising inductively by developing a 'pattern of meaning' (Creswell, 2013). Using a social constructivist framework recognises that meaning is formed through interactions with others, and historical and cultural influences. Interpreting results through this social constructivist framework enabled the teachers' specific context to be considered, allowing the historical and cultural settings of the teachers to be understood. The nature of the researcher allowed the researcher to position herself within the research, acknowledging how her own experiences and backgrounds shaped the interpretation of the results.

Epistemology

Epistemology is about how the research explores and finds out about the events that exist in the social world (Thomas, 2009). It is concerned with the basic belief about knowledge and what can be known (Guba & Lincoln, 1994). Creswell (2013) suggests, "With the epistemological assumptions, conducting qualitative studies means that researchers try to get as close as possible to the participants being studied" (p. 20). The research design (more detail provided later in this chapter) adopted within this study enabled the researcher to be in the 'field', embedded in the work and lives of the participants. The researcher collaborated with the participants, assembling subjective evidence based on the individual teachers'

participation in the research process and relying on quotes as evidence. As such, 'how knowledge is known', was through the subjective experiences of the teachers. The researcher was embedded in the learning culture, an 'insider' (Creswell, 2013), getting to know what the teachers knew and what the teachers needed to support them in the implementation of GCAs. Consistent with a social constructivist framework, reality is co-constructed between the research and the teachers, and shaped by their individual experiences (Creswell, 2013).

Axiology

Axiology is concerned with the role of values within research (Creswell, 2013). Creswell (2013) suggests, all researchers bring values to the study, known as the axiological assumptions. In qualitative research, researchers make their values and biases known, recognising the influence these values may have on the results. Making the axiology explicit helps to set and clarify the guiding tone and rigour for action in research (Ahmad Aliya, Singhry, Adamu, & Abubakar, 2015). Acknowledging the researcher's positioning and potential for bias within this study is believed to increase the validity of the research. Given the interpretive framework used to understand the findings of this study, identifying the researcher's values and biases was important since they played a role in the discourse and informed the researcher's interpretation of the data. Thus, to identify the axiological assumptions within this study, the researcher provided a detailed biography (Appendix 3), along with the following researcher's stance, discussing her background and experiences, to identify how this may impact the results. The researcher also presents a detailed biography of the school and each of the teachers within the study (Appendix 5 & 6). Informed by the researcher's anecdotal observations and supported with the data, these biographies are written using a literary style, with the researchers voice apparent in the text. Thereby, the researcher admits that the findings represent an interpretation and presentation of the researcher, along with the teachers within the study.

Researcher's Stance

In examining the researcher's biography (see Appendix 3), it is possible to see how the researchers' values may have led into a number of choices within this study. As Bogdan and Biklen (1992) suggest, the researcher engaged in the research project because of her own biography. It was the researcher's experiences with Game Centred Approaches (GCAs) as a student, an educator and as a curriculum support officer in the Physical Education field that

led to the inception of this research project. The project was born out of her bias for and success with games-centred pedagogy, along with her frustrations as a Head Teacher trying to support her faculty to implement GCAs. Moreover, the researcher's role leading Professional Development opportunities within schools and as a curriculum support officer clearly directed the direction of the research informing the choice of the research problem and questions. With the researcher's values grounded in student-centred pedagogy, with their philosophical underpinnings aligned with constructivist perspectives and situated theories of learning, it is possible that the researcher's teaching pedagogy also guided and informed the choice of theoretical framework. The philosophical assumptions within the study were clearly aligned to the same social constructivist lens. The opportunity to meet like-minded researchers as part of her teaching scholarship provided the opportunity to explore research rooted in the same paradigm, further refining the research direction and methodological choices. Taking these values and biases into consideration, the researcher acknowledges how her background and experiences lead to the interpretation of the data, in conjunction with those of the teachers.

Methodology

Burns (2000) suggests that the task of the qualitative methodologist is to try and capture and interpret what people do and say, to understand the complexity of the world from the viewpoints of the participants. Furthermore, Creswell (2013) suggests that the methodology for qualitative research are characterised as "indicative, emerging, and shaped by the researchers experience in collecting and analysing data" (p. 22). Guided by the social constructivist, interpretive framework adopted in this study, the methodological beliefs or approach to inquiry adopted used an inductive method, supported with deductive analysis, where the theory or meaning emerged from the data, 'ground-up' (Creswell, 2013), through the methods of interviewing, observing and document analysis. A case study approach and action research framework were selected as the method of inquiry, adopting a literary style of writing when presenting the findings. Typical of qualitative research of this nature, the research questions were refined throughout the research process, to better reflect and understand the research problem (Creswell, 2013).

The study design

The term 'research design' or 'study design' is used to refer as the researcher's plan of how

to proceed in the research process, considering the researcher's expectations and context (Bogdan & Biklen, 1992, Thomas, 2009). Ragin (1994) defines research design stating,

> Research design is a plan for collecting and analysing evidence that will make it possible for the investigator to answer whatever questions he or she has posed. The design of an investigation touches almost all aspects of the research, from the minute details of data collection to the selection of the techniques of data analysis. (p.191)

As such, the research design of this study adopted a qualitative approach, combining a case study (Stake, 2003) and action research approaches (Kemmis & McTaggart, 1988). Case study research was chosen since this study examined a specific 'case' where the teachers and the researcher studied themselves, their actions and their reflections. Furthermore, the research was a dynamic process resulting in action and changes to practice because of the reflections; hence, action research (Stringer, 1996). Specifically, this study aimed to explore the process of teacher Professional Development (PD), to understand better how to support teachers in implementing GCAs. Action Research (AR) was chosen due to its reflexive and revealing process. Both the case study and action research approaches are described later in this chapter.

Case study research

Essentially, this research study was an observational case study of an action research process, in which the teacher participants and the researcher were all part of the process. In case study research, the researcher investigates in depth a program, an event, an activity, a process, or one or more individuals (Stake, 2003). Expanding on the concept, Creswell (2007) states; "case study research is a qualitative approach in which the investigator explores a bounded system or multiple bounded systems over time, through detailed, in-depth data collection involving multiple sources of information and reports a description of case-based themes" (p. 73). Observational case studies often focus on a classroom, group, teacher or pupil (Burns, 2000). Case study research aims to "get a rich detailed understanding of the case by examining aspects of it in detail" (Thomas, 1999, p. 115).

In this case, the researcher investigated the PD process with the four teacher participants. This case study research aimed to gain a detailed understanding of how best to support

teachers in implementing game-based pedagogy into their teaching practice. In this study, the researcher investigated in-depth the four-teacher participant's professional learning, as they attempted to plan and implement (teach and assess) a GCA unit of work. Each of the four teachers presented a different 'case' as part of the overall case study. Each teacher was studied as a separate 'case' so that the researcher could gain insight into the individual teacher's 'story' and context. It is essential to note the role of the researcher within the action research process; as such, the researcher represents a further 'case' within this study. Given the researcher's impact on the research process, the researcher's biography is presented in Appendix 3. The researcher's stance is also presented above with the axiology of the study, informing the overall case study.

Expanding on previous definitions (see Yin, 1981), Yin (2018) suggests that the definition of a case study as a research method is twofold, explaining,

1. A case study is an empirical method that:
    - investigates a contemporary phenomenon (the 'case') in depth and within its real-world context
    - the boundaries between phenomenon and context may not be clearly evident;
2. A case study:
    - copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result
    - benefits from the prior development of theoretical propositions to guide design, data collection, and analysis, and as another result
    - relies on multiple sources of evidence, with data needing to converge in a triangulating fashion

(Yin, 2018, p.61).

Consistent with Yin's (2018) definition of case study research, these important features of empirical methodology are evident within this study, since the researcher wants to understand a 'real-world case' by observing the teachers whilst learning to design and implement a GCA within their usual teaching environment. Such an understanding is believed to involve important contextual conditions pertinent to this specific case (Yin & Davis, 2007). As such, unlike other experimental research, that typically ignores or try to control the context, this case study research deliberately sets out to investigate them. Often phenomena and context

are not always distinguishable (Yin, 2018). Therefore, other methodological characteristics are relevant such as the multiple methods of data collection employed including focus group interviews, document analysis, observations and reflections and multiple data sources are collected, providing rich data to analyse and generate findings. These data sources are triangulated in order to corroborate the findings. The research design is clearly outlined, justified and guided by the literature. The theoretical framework for this study is articulated, providing a foundation for the research.

Action Research

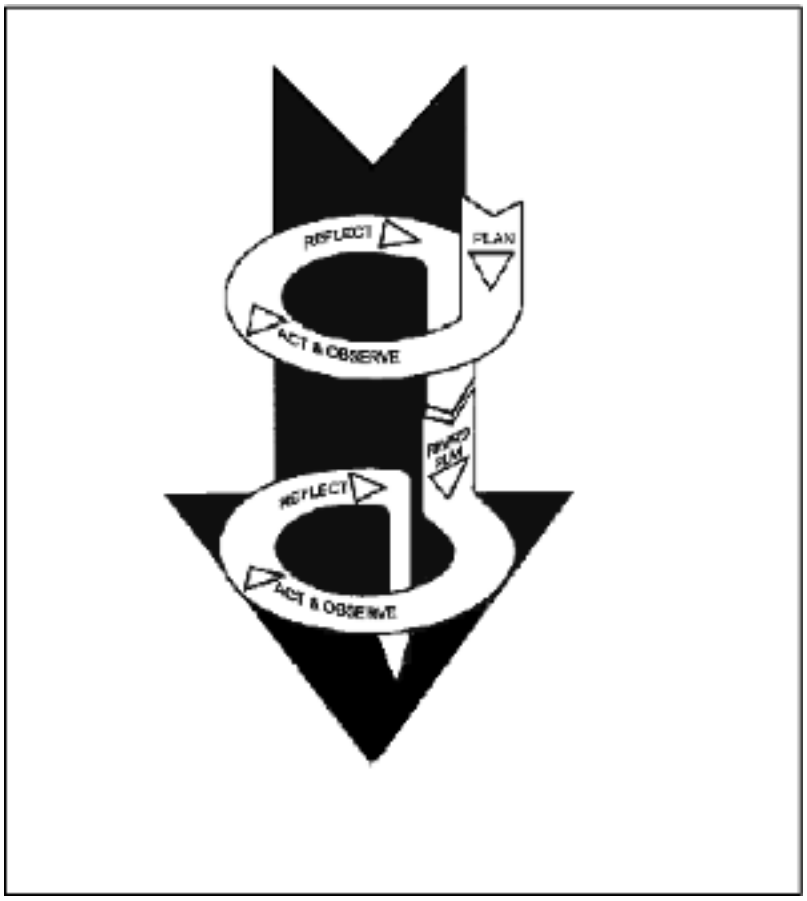
Action Research (AR) is defined as, "a form of collective self-reflective inquiry undertaken by participants in a social situation in order to improve rationality and justice of their own social practices, as well as their understanding of the practices and situation in which these practices are carried out" (Kemmis & McTaggart, 1988, p. 5). The general aim of action research is to generate new knowledge, offering descriptions, explanations and analyses for action (McNiff & Whitehead, 2009). Kemmis (2009) indicates AR aims to change three things, "practitioners' practices, their understandings of their practices, and the conditions in which they practise" (p.463). McNiff and Whitehead (2009) add to this suggesting that the goal of AR is to "improve a personal or social situation", where the research offers possible explanations for action; and the findings 'tell the story' and "communicate the significance of the action research for public legitimation" (p. 17). In the case of this study, the action aimed to transform teaching practice to improve student learning outcomes. Thereby, the research aimed to offer explanations about teachers professional learning when designing and implementing GCAs. In essence, what elements of the professional learning worked and what does not. In this way, the AR approach was central to both the research approach and the design of the PD model posited within this thesis.

AR as a research approach, is a cyclical process where the researcher is engaged in the continuous practice of reflection and adaptation. Kemmis and McTaggart's (1988) AR framework was used to guide the research process (see Figure 5). Their framework involves the ongoing process of

I. **Plan:** develop a plan for improvement,
II. **Act:** implement the plan,
III. **Observe:** observe and document the effects of the plan, and

IV. **Reflect:** reflect on the effects of the plan for further planning and informed action.

Figure 5. *The Kemmis and McTaggart (1988) Action Research spiral/cycle (p.2)*



AR research is often linked with improvements in teaching practice as an educational strategy, promoting teacher self-improvement (Burns, 2000). Kemmis and McTaggart (1988) explain that the central goal of AR is the improvement of teaching practice through systematic investigation. AR intends to find out the proper actions to improve teaching skills (Çorlu, 2005). It encourages group cooperation and cohesiveness, relates to creativity and critical thinking and promotes change (Burns, 2000). AR does not only provide scientific evidence to such actions that may improve teaching skills, but it also generates important practitioner-relevant information (Çorlu, Niğdelioğlu, & Kaymak, 2008). In his later work, Kemmis (2009) suggests that there are three aims to practitioner research, (i) change practitioners' practice, (ii) their understanding of their practices, and (iii) the conditions in which they practice, arguing that this change could be achieved over time by closing the gap between the roles of theorists and practitioners. In this setting, the AR aimed to change the

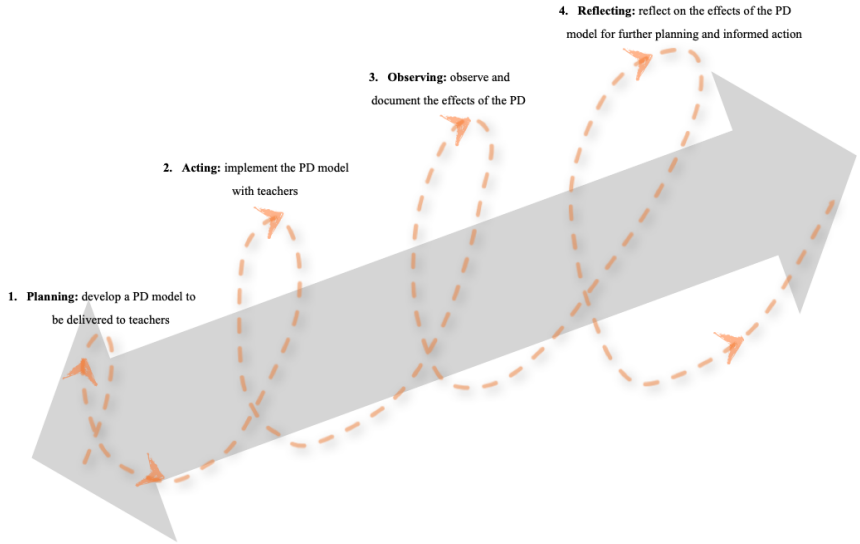
teachers practice adopting game-based pedagogy; bridging the epistemological gap between GCA theory and practice.

Significantly, many researchers link AR and critical reflection or reflective practice (see: Kemmis and McTaggart, 1988; Leask, 2001; McNiff, 1993; Pollard, 2002). Leask (2001) states, "action research is a term used to describe reflective practice" (p. 278), whilst McNiff (1993) suggests that AR takes the form of critical reflection in action and on action. Similarly, Bodner and MacIsaac (1995) describe AR as the process of self-reflective inquiry, in which teachers systematically and critically reflect on their work and make changes in their practice as a result of their reflection.

Since the intention in undertaking this research was to find out how best to support teachers to make changes to their teaching practice; it was clear that this study would constitute a form of action research. As such, Kemmis and McTaggart's (1988) notable AR framework was used to guide the research process, as well as the development of the PD model for learning. In this setting, Kemmis and McTaggart (1988) notable AR framework, has been adapted to this study's context (see Figure 6), consisting of the ongoing process of:

1. **Planning:** develop a PD model to be delivered to teachers. Working out ways that might individually, or collectively support the teachers to implement GCAs.
2. **Acting:** implement the PD model with teachers. Implementing the necessary support to observe the impact on practice.
3. **Observing:** observe and document the effects of the PD. Gathering information regarding the effectiveness of the support strategies and the realities and complexities of the situation and practices.
4. **Reflecting:** reflect on the effects of the PD model for further planning and informed action. Analysing the impact of the PD support

Figure 6. *Action research process used in this study*



The process of critical reflection played a significant role in this study, informing both the teachers' practice and the professional development in terms of how to best support teachers in implementing games-based pedagogy in their teaching practice. Each of the teachers and the researcher were required to undertake the self-reflective inquiry required by the AR process. The teachers were required to critically reflect on their work and make changes to their practice resulting from their reflection. The research was required to reflect on the teachers' practice and the necessary support as part of the professional development being offered.

The study context

In outlining the framework of the study, it is important to orientate the reader to the context and background in which the research was conducted (Creswell, 2013). Stake (2000, 2005) explains, these thick and detailed descriptions of the contexts that allow the reader to experience vicariously the particular, ordinary or exceptional experiences and views of others. As Flyvbjerg (2004) suggests, they provide a significant route to knowledge, as readers compare how these cases are like or unlike their own experiences. Within this section, detailed information will be provided associated with the research setting and study participants.

The research setting

The study site for this research was a New South Wales public education Secondary School situated in the North Sydney region. The school is a culturally diverse, co-educational specialist high school with a creative arts focus. The school population is 517 students from years 7-12, with a teaching staff of 45. The school has a strong relationship between the academic, physical, mental and socio-cultural needs of students, considering them of equal importance and crucial to ensuring successful educational outcomes. The school offers a well-balanced curriculum with a wide range of academic, creative, sporting, performing and co-curricular experiences, including leadership opportunities. The Quality Teaching Framework (NSW, DET, 2003) features extensively within the school curriculum binding learning across the school and ensures that the needs of all students are met. A detailed biography of the school and the teacher participants can be found in Appendix 5 and 6.

Study Participants

Burns (2000) suggests, "crucial to any successful case study of a group is the definition of the group as a unit which separates it in some way from the general population" (p. 462). Therefore, in selecting a group of participants for this study, it was essential that the group not only identified with each other but also shared the same expectations and interacted in a close way. The participant group was comprised of the teacher participants, student participants, lead researcher and expert panel.

Teacher participants

The Personal Development, Health and Physical Education (PDHPE) faculty includes four full-time health and physical education teachers. Two Male: Barry and Fred and two Female: Jenna and Sarah (Please note pseudonyms have been used to protect the privacy of the participants). Barry, Fred and Jenna are all permanent members of staff at the school, while Jenna is a full-time temporary member of staff. Barry is 55, with over 30 years of teaching experience and has taught at the school for 19 years. He also takes on the whole school role of sports organiser. Fred and Jenna are in their late thirties. Jenna has been at the school for 13 years and takes on a wider school role as year 12, year coordinator. Fred has been at the school for nine years and takes on the assistant year coordinator role for year 11. Sarah is a newly qualified teacher and has been teaching at the site school for the last two years, since finishing University.

The teachers in this study had a varying range of teaching experience. Jenna, Fred and Barry were experienced teachers having taught for many years and were very established at the school. Sarah was a newly qualified teacher, completing her undergraduate degree two years earlier, taking up a temporary position at the school. The teachers had been involved in some limited PD opportunities in supporting implementation and programming of the New South Wales syllabus, which had quality teaching and GCA elements housed within but had received no specific PD in the implementation of GCAs. Three of the four teachers demonstrated an unfamiliarity with the approach and despite their experience in teaching in general, had little if any experience in using GCAs in practice. More detailed biographies of the teachers, which outlines their teaching experience and practice can be found in Appendix 6.

Student participants

The student participants of the study include three Year 9 PDHPE classes. Classes were mixed gender and homogenous. Class sizes were 22, 24 and 25, with a total of 71 student participants engaged in the PE lessons as part of the study. These classes were purposefully selected, based on the teachers' belief that they were the most suitable group to be taught using game-based pedagogy. The three Year 9 classes were timetabled for PE at the same time on a Wednesday and Friday of week A and Thursday and Friday of week B. The teachers also believed this to be beneficial to the study since they could team-teach the classes if they wanted to, and it also allowed for better collaboration. Since Fred withdrew from the study before the implementation stage, there were only 2 classes engaged in the PE lessons as part of this study; Sarah's class of 22 and Jenna's class of 25, a total of 47 students. The cohort of students chosen for this study was selected based on the teachers' belief that they would be the most receptive to GCAs and that they demonstrated the perceived characteristics the teachers deemed essential for this study, that is, they were well behaved and more physically able. However, the group of students used within this study had not previously been taught using games-based pedagogy.

Lead researcher

Unlike classical research, the role of the researcher in Action Research is fundamentally different where the researcher may adopt completely different roles (Burns, 2000). Similarly,

in case study research, researchers are "rarely total participants or total observers (Bruns, 2000, p. 462). In this study, the researcher's role was multi-faceted, assuming several responsibilities, including initiating the research, being the person whom the participants approach for advice and being the PD provider. The researcher assumed the role, Reinking and Bradley (2008) term, 'purposeful agent of change', where the researcher worked closely with teachers to implement interventions that work to positively affect the intervention to make it more conducive for teachers' productive use in their journey of teaching and learning. The researcher worked closely with the teachers, supporting them to implement the GCA unit and lessons and explore what support they needed when implementing this game-based pedagogy. Burns (2000) advocates this combination of a teachers and researcher, suggestions it is a "useful way to get actions research on the road, although, warns of the danger of the "'outsider' or 'consultant' or 'facilitator' role" (p.456). Heeding this advice, the researcher was particularly aware of ensuring the teachers were active in the 'self-reflective' spiral of planning, acting, observing and reflecting.

Creswell (2007) defined a similar role as 'participant observer' where the research is immersed in the research setting. The researcher is engaged with the ongoing social interactions of the participants both in the way of active participation and observation. Essentially, the researcher in this study was embedded in the field of research and immersed in the social interactions of the teachers. However, the researcher's role entailed more than just observation. The researcher not only participated and observed but she also created and adapted the professional development. The researcher refined the teachers teaching practice based on the reflections and observations, as a means of supporting the successful implementation of the GCA unit and lessons.

The important part of using AR to inform the PD model and to guide the research process was that it allowed the researcher to act as a 'purposeful agent of change' (Reinking & Bradley, 2008). The cyclic process of planning, acting, observing and reflecting allowed adaptions to be made in-situ and action to be taken as a result of the ongoing reflections on practice. Within this perspective, the researcher worked as an agent on behalf or with the teachers to develop and provide professional development that supported the teachers to successfully implementing game-based pedagogy in their teaching practice. The researcher was an active agent, involved in the co-construction of the units and lesson plans, the

implementation of the lessons, along with the observation and reflection, and the day-to-day interaction related to the professional development and the lesson implementation.

Expert panel

As part of the PD process, an expert panel comprised of three male University PDHPE lecturers, specialising in games-based pedagogy, was formed to validate the teachers' GCA practice, ensuring authenticity of GCAs. The expert panel also played a supportive role in the OPD process, providing advice and guidance on the teachers planning and implementation of the games-based pedagogy whilst ensuring authenticity to the model. All three lecturers were from the University of Wollongong, teaching in the Physical Education Teacher Education program and had extensive research and teaching experience in GCAs. The main purpose of this expert panel was to provide the researcher with specific feedback and advice about GCAs, ensuring the fidelity of practice and the teachers' authenticity to the model, within the PD framework. The expert panel was used for peer debriefing in the research process, enhancing the trustworthiness and credibility of the research.

Ethical considerations

Ethical considerations are paramount to research to protect the interests of those who take part in a study (Flick, 2009). As such, codes of ethics and ethics committees have been developed to protect those involved in the research. This study was conducted within the guidelines established by the Human Research Ethics Review Committee of Wollongong University (see Appendix 7 for the ethics approval). Ethical approval was also obtained from the New South Wales, Department of Education and Communities (NSW, DEC), in line with the State Education Research Applications Process (SERAP) (see Appendix 8 for the SERAP approval letter). The NSW, DEC needs to ensure that any research conducted in a government school is of high quality is consistent with the provisions of the National Statement on Ethical Conduct in Human Research and supports departmental goals and strategic directions. Ethical considerations ensuring the respect and protection of participants were of prime concern during this study. As such, this study observed all ethical considerations regarding privacy, anonymity, sensitivity, confidentiality, risk and harm and proper measures were taken to ensure this observance.

Minimisation of risk or harm

Codes of ethics require that research should avoid "harming the participants, including not invading their privacy and not deceiving them about the research's aims" (Flick, 2009, p.37). Child protection and duty of care feature highly on the criteria for approval under the State Education Research Applications Process (SERAP). The Department of Education (Nd) upholds a "common law duty to ensure that reasonable steps are taken to protect students at all times from risks that are reasonably foreseeable, including physical, psychological and other forms of harm" (NSW DEC, Nd). Atkins and Wallace (2012) remind researchers that harm may not just include the immediate consequences for participants, but also include future consequences for those involved in the research.

This study ensured that no students were exposed to risk or that their educational progress or well-being was adversely affected. Students did not miss any part of the curriculum or educational opportunities. Neither did this research aim to affect the teacher participants within this study adversely. The nature of the study involves a personal and collaborative reflection on their teaching. By its very nature, this may prove to be a sensitive issue. Every effort was made to create a supportive sharing environment, where teachers felt valued and safe to share information. As such, the teacher participants were treated like co-researchers. They were actively involved in each step of the action research process, working collaboratively to explore the process of teacher professional learning and teaching games. The study demanded time to plan and share ideas and reflections; every effort was made to make sure this time was flexible and convenient for the teacher participants. Further to this, timetabling and school commitments were also taken into consideration.

Sensitivity and respect

Every effort was made in this study to ensure that all participants involved (teachers and students) will be treated with sensitivity and with due regard to their personal and private lives and their cultural, religious and other beliefs. Participants have the right to refuse participation at any point during this study.

Informed consent

Informed consent, where participants are fully informed of the nature and purpose of the research and recruited without coercion, is the most fundamental principle of qualitative research (Burns 2000). Flick (2009) suggests that a general rule for participation in sociological investigations is that it is voluntary, where participants are provided with the fullest possible information about the goals and methods of the research. The NSW, DEC (2015) requires that active consent be granted for all participants, "active consent requires that participants provide written consent to participate in the proposed research (p.7). Atkins and Wallace (2012) advise that "making consent as informed as possible demonstrates respect for individuals' autonomy since they are able to make a more objective personal decision about the implications of participating and also, in some cases, about withdrawing from the study if they come to feel that they no longer wish to participate" (p. 32). In this study, all teacher participants were given an information letter that provided details in relation to the aims and intentions of the study before they participate (see Appendix 9). They were also provided with detailed information in which they could make a realistic judgement on the expectations of the study and any possible consequences of taking part. From this, consent from each teacher participant was obtained in writing (see Appendix 10).

Voluntary participation

Only those who are voluntarily participating and have been informed about the study should be involved in the data collection (Flick, 2011). Burns (2000) warns of the implications of using volunteering participants, suggesting they are not likely a random sample of the population. Participation in this study relied on recruitment through the Pedagogical Laboratory for Physical Education and Sport at UOW. All participants in this research voluntarily agreed to participate in the data collection methods. All participants were informed that they could refuse to take part in the study at any time and that all information and data obtained within the study will have no impact on their relationship with their researcher or University or position at the school.

Privacy and confidentiality

Confidentiality issues relating to anonymity and use of data need to be made clear to the participants. Only the researcher, expert body and the teacher participants will have access to the information obtained in this study. Burns (2000) suggests that it is "extremely important

to ensure that responses to personal questions, scores on tests etc. are confidential and anonymous so that the reader of the research would be unable to deduce the identity of the individual" (p.20). Therefore, all identifiable information will be removed when reporting on the data. Pseudonyms will be used to identify participants in any publications (thesis, journal article or conference paper). Data collection will be treated with sensitivity and confidentiality. Additionally, if the teachers' consent, they will receive credit and acknowledgement for their contribution.

Recruitment

The University of Wollongong (UOW), Pedagogical Laboratory for Physical Education and Sport provided the link between the research team and potential participants. Interested teachers participating in this established network were approached and provided with the information regarding the study and participant requirements. Principals of interested teacher participants were also contacted and provided the relevant information so they could help their teachers/faculty make an informed choice in participating in this research project.

A purposeful sample of teachers interested in conducting a professional learning intervention was selected from the established network of professionals within the UOW Pedagogical Laboratory for Physical Education and Sport. This sample consisted of four PDHPE teachers within the one school's PDHPE faculty. Purposive sampling where "a case is selected because it serves the real purpose and objectives of the researcher of discovering, gaining insight and understanding into a particularly chosen phenomenon" (Burns, 2000, p.465) is often applied in case study research. In the case of this study, the teacher participants presented a 'typical case', highlighting the average PDHPE teacher, within a typical school setting. The teacher participant also presented a 'convenient case' sample given their availability through being linked to a network and also volunteering their participation.

All four participants volunteered to participate in this research. They were given information letters and engaged in a pre-research information session, where they were informed of the requirements of the study. They were asked to provide written consent before engaging in the research study.

Game Centred Approach and Fidelity

Game-Centred Approach in Practice

Researchers investigating models-based practice such as GCAs have been criticised for insufficiently reporting fidelity measures (O'Donnell, 2008; Hastie & Casey, 2014). For that reason, this study reports on the key elements of model-based practice as reported by Hastie and Casey (2014). Reporting these elements ensures the study provides a sufficient report of the methods used, allowing the readers to gain an accurate and complete understanding of the result reported in this research. These key elements include,

I. rich description of the curricular elements of the unit,
II. a detailed validation of model implementation, and
III. a detailed description of the program context that includes the previous experiences of the teacher and students with the model or with models-based practice.

(Hastie & Casey, 2014)

Curricular elements of the unit and the validation measures used are outlined below. A detailed description of the teachers' previous experiences with GCAs is provided in their biographies (Appendix 6) to provide program context. Further context is provided in the participant section above, where it was evident that the teachers' and students' prior experiences with GCAs were limited. The teachers' limited experience with GCAs is also clearly illustrated within the results.

Description of the curricular elements of the unit

Hastie and Casey (2014) argue that any research reporting on pedagogical models detail the "curricular aspects of the intervention" and include a "comprehensive account of the unit of work completed by the student" (p.424). In response, a detailed description of the curricular aspects of the pedagogical model used within this study and the unit of work designed and implemented with the teachers and students is provided. The teachers designed an invasion games unit of work, with each teacher using the unit to plan their individual lessons within their chosen sport. For Sarah, this was in Soccer, Jenna in Netball, and Fred and Barry in Touch.

The Tactical Games Model – A Game-Centred Approach

The Tactical Games Model (TGM) (Griffin, Mitchell, & Oslin, 2006) was chosen as the pedagogical model to scaffold the teachers' learning of GCAs and the framework for their implementation of games-based pedagogy. The TGM was chosen as the specific model of GCAs since it encourages teachers to structure lessons so that students are engaged in a series of purposeful learning experiences (Game 1, Q&A, situated practice, and Game 2) through small-sided, modified games and critical thinking opportunities, where they are encouraged to solve tactical problems. Griffin, Dodds, and Rovegno (1996) identified TGM as a way for teachers to demonstrate Pedagogical Content Knowledge (PCK) (Shulman, 1986) in physical education. They suggest that using the TGM, "conceptualises the purpose of teaching games, offers a curricular knowledge base, provides instructional strategies, and proposes levels of students' knowledge to create more powerful PCK" (Griffin, Dodds, & Rovegno, 1996, p. 58). Metzler (2011) outlines the Tactical Games Model (TGM) in his book 'Instructional Models for Physical Education'. He provides a detailed overview of the foundations and features of the model, along with the implementation needs and modifications required for implementation. Metzler (2011) also outlines the validation and verification measures that measure the degree of faithfulness in which the model has been implemented. As such, Metzler's (2011) 'tactical games teachers' benchmarks' were used as a 'blueprint' or guide to describe the instructional processes, content organisation, task structures and sequence of learning, to support the teachers learning. They were also used as a verification measure for the successful implementation of GCAs. In this thesis, analysis using the observational benchmark tool provided a lens through which to assess and make a judgment on teacher PCK of GCAs.

As guided by the TGM, games and game situations were built into a purposeful whole-part-whole sequence of TGM learning situations (Game 1, Q & A, Practice, and Game 2) to help students develop tactical awareness and improve their overall games playing/game performance (Mitchell, Oslin, & Griffin, 2006). See Appendices (Appendix 11 & 12) for unit and lesson plan template provided to the teachers to scaffold their planning. Lesson delivery was concept-based, where teachers were encouraged to set a tactical problem to be solved within the lesson, and subsequent earning experiences were purposefully designed to guide students in solving the tactical problem. Small-sided, modified and conditioned games were used, for example, uneven teams with weighted offence and defence (e.g. 2v3) and adapted

playing areas (e.g. varying the length and width of the playing fields). The teachers were encouraged to build problem-solving into the lesson by stopping individual students, groups of students or the whole game and asking questions. Mitchell, Oslin, and Griffin (2006) resource was used to guide the tactical problems to be solved. Herein, this research refers to the TGM as a GCA making the connection with the pedagogical concept.

Instructional time

On commencing this study, it was anticipated that the research would span two cycles of AR, studying the teachers' implementation of two GCA units of work. It was intended that each unit of work would include ten lessons, over a five to six-week period. This time span was deemed to be ongoing and continuous for the PD. However, due to a range of contextual factors including timetable constraints and class changes; whole school activities consuming PDHPE lesson time, such as assemblies, excursions; teacher absence, Year 12 leavers ceremonies; the research only reports one cycle of research, conducted over one unit of work of six-lessons for Jenna and five lessons for Sarah. Sarah was not able to deliver her final lesson as a result of a History excursion conducted with the entire year group, taking the students out of their scheduled PE lesson. Lessons ran for 60 minutes each with a total of 300 minutes instruction time for Sarah and 360 minutes instruction time for Jenna.

Validation of model implementation

The GCA research has advocated for the articulation of verification approaches used in GCA research, where a growing body of research now includes established benchmarks (e.g. Greco, Memmert & Morales, 2010; Harvey 2009; Jarrett, 2011; Harvey, Cushion, & Massa-Gonzalez, 2010; Harvey, Cushion, Wegis & Massa-Gonzalez, 2010; Memmert, 2006, 2007). Hastie and Casey (2014) argue that providing validation of model fidelity is crucial to show that the instruction is consistent with the accepted standards of the given model. Similarly, Harvey and Jarrett (2014) and Jarrett and Harvey (2016) suggest that articulating the verification process may help practitioners with the implementation of GCAs. As such, it was essential to articulate the verification procedures used in this study.

This study draws on the research and uses Metzler's (2011) eight 'tactical games teacher benchmarks' that identify pedagogical behaviours necessary for the delivery of the GCA. These benchmarks present verification of the GCA instructional process to ensure that the

model has been "designed and implemented with an acceptable degree of faithfulness, increasing the likelihood that the stated student learning outcomes will be achieved" (Metzler, 2011, p. 375). These benchmark elements are as follows:

1. The teacher uses a tactical problem as the organising centre for learning tasks
2. The teacher begins unit segment with a game form to assess student knowledge
3. The teacher identifies needed tactical and skill areas from the game form
4. The teacher uses deductive questions to get students to solve the tactical problem
5. The teacher uses clear communications for situated learning tasks
6. The teacher uses high rates of guides and feedback during situated learning tasks
7. The teacher provides a review that includes the tactical problems of the lesson
8. Assessment

(Metzler, 2011, p. 376)

Non-negotiable elements for the authentic implementation of GCAs

While Metzler's (2001) 'tactical games teacher benchmarks' offer key criteria to determine if the teacher is 'doing the model' or authentically implementing the model, it has been suggested that not all benchmarks need to be met when using curriculum models (Hastie & Casey, 2014). Nevertheless, all benchmark elements were examined since this allowed the researcher to identify what knowledge and understanding were already established and what areas were needed. Following the lead of Gurvitch, Blankenship, Metzler, and Lund (2008), Harvey, Gil-Arias, Smith, & Smith (2017) and Harvey and Robertson (2017) four key 'non- negotiable' teacher benchmarks, which included: teacher uses tactical problems as the organising centre for the learning tasks, the teacher begins each lesson with a game form to assess students' knowledge, the teacher uses deductive questions to get students to solve tactical problems, the teacher uses high rates of guides and feedback during situated learning tasks, were highlighted and 'non-negotiable elements.

Faithful Implementation of a Game Centred Approach (GCA)

Faithful or authentic implementation of the TGM, or in this case GCA, should support the expected learning outcomes (e.g., improved games playing) for the model (Metzler, 2005). Therefore, faithful implementation of the GCA was observed through the teachers' efforts to plan and implement lessons that demonstrate a version of the GCA during the instructional unit. That is, the unit and lesson plans, along with lesson observations, showed alignment

with the GCA and associated benchmark and the four 'non-negotiable' elements. For example, if a reasonable version of GCA was used, small-sided modified games are built into a purposeful sequence of learning situations (Game 1, Q & A, Practice, and Game 2) and skill practice is situated in game-like situations that help students transfer improved skills and movements to future games playing. Also, a tactical problem serves as the learning focus that permeates all aspects of the GCA lesson. The additional benefit of documenting planning and teaching is that teachers will have examples of faithful implementation of the GCA in physical education for future learning, to support the ongoing implementation of GCAs.

The data collection process

In qualitative studies of this nature, Burns (2000) advocates the collection of multiple sources of data, maintaining a chain of evidence and recording data when collecting data in case study research. The triangulation of multiple and different sources, methods, investigators and theories provide corroborating evidence, improving the reliability and validity of data and findings (Burns, 2000; Creswell, 2013). As such, multiple methods of data collection were used as part of this study, including focus group interviews, teacher reflections, researcher reflection journal, lesson observations and documentation sources including unit plans, lesson plans, and assessment tasks, email correspondence, and chat dialogue in Google Docs (see Table 3). These data sources were used in triangulation with each other to strengthen and support the evidence gained during data analysis.

As prescribed by the Action Research (AR) process, data collection and data analysis occurred simultaneously throughout the course of the study. Guided by Kemmis and McTaggart's (1988) plan, act, observe and reflect AR framework, data collection and analysis was conducted across the four PD phases, that is, the needs assessment, planning, implementation and evaluation. The phases of data collection and the corresponding sources of data are illustrated in Table 3. As such, multiple methods of data collection were used as part of this study, including documentation sources including focus group interview, email correspondence, researcher reflection journal, document analysis, teacher reflections, and lesson observations.

Focus group interview

Focus group interviews were chosen for this study because they provide the researcher with the opportunity to study opinions and are believed to provide rich data, since participants are more likely to provide more information than one-to-one interviews, allowing a more detailed investigation into events (Burns, 2000, Flick, 2011). Focus group interviews encourage multiple interactions between group members as a means of obtaining data and are useful in establishing participants' reactions to the proposed change and evaluating new programs and procedures (Gratton & Jones, 2010, Dickson, 2000). In the case of this study, the focus group interviews provided the teachers with a forum to share practice and reflect on their lessons. The teacher focus groups provided a collaborative space where the teachers, along with the researcher, were encouraged to support each other in implementing game-centred pedagogy and share resources and ideas, as with the conditions of a Professional Learning Community (PLC). The researcher was able to use these interviews to gather data regarding the teachers' opinions and reactions to both the PD model posited and the implemented pedagogy.

Bellenger et al. (1976) highlighted, "The one thing on which everyone agrees with respect to focus group interviews is that the moderator's role is of prime importance to the success" (p. 13). In this setting, the researcher played the role of 'facilitator or moderator' (Thomas, 2009), trying to promote discussion among participants. Often the researcher took a more active role in the discussion to try and promote dialogue, particularly at the beginning of the study. However, once the teachers were more familiar with the format and more comfortable with the researcher, the conversation flowed more freely, allowing the researcher to take a less active role and observe the teachers' response and interactions.

Fifteen teacher focus groups were conducted across the four research phases (see Table 3). These focus groups involved the researcher and the participating teachers, although not all teachers participated in every interview (see Table 3 for participants). The focus group interviews lasted between 35-45 minutes and were audio-recorded using a mobile application that stored and dated the recording. These interviews were later transcribed verbatim for analysis and imported into NVivo version 9 (QSR International, 2010).

Semi-structured format

Interviews can be categorised as structured, unstructured or semi-structured, where a semi-structured format was selected for the focus groups in this study. Thomas (2009) believes that "the semi-structured interview provides the best of both worlds as far as interviewing is concerned, combining the structure of a list of issues to be covered together with the freedom to follow up points as necessary" (p. 164). As such, a semi-structured format of prescribed open-ended questions was used when conducting the focus group interviews (see Appendix 13), permitting greater flexibility and more valid responses from the participants' perception of events (Burns, 2000). Heeding Creswell's (2013) advise an interview protocol was designed to keep the interview on track and to log a detailed account of the interview details (see Appendix 14). Interview protocols have been described as "a predesigned form used to record information collected during an observation or interview" (Creswell, 2007, p. 135) or "a guide of the general issues they [researchers] wish to cover" (Burns, 2000, p.428). The interview protocols used within this study were comprised using interactive google docs, with five to seven open-ended questions developed from the research question and areas that sought further clarification from preceding discussions (see Appendix 13). The purpose of each PD phase also guided the questioning. Thomas (2009) suggests that an open-ended question "is one that allows respondents to reply in whatever way they wish" (p. 162). As such, the teachers we allowed to freely reply to the questions.

Recording procedures

All interviews were recorded and later transcribed, enabling the researcher to be part of the interview; not having to take notes enables the researcher to take part in the conversation naturally (Burns, 2000). An electronic voice-recording app on the iPhone was used which had an adequate microphone and allowed recordings to be labelled accordingly, stored chronologically and downloaded into various file formats. Creswell (2007) further suggests, "care must be taken to encourage all participants to talk and to monitor individuals who may dominate the conversation" (p. 164). The researcher invited responses from all participants, trying to engage them in a discussion through eliciting responses through storytelling and getting the teachers to tell a story about themselves or an event. A funnelling approach was used where the researcher "gradually guides the direction of the interview by commencing with broad general questions and focussing progressively onto the topic with more specific questions" (Burns, 2000, p.429). Once transcribed, the interview transcripts were uploaded

and shared with the participants via Google Docs, a collaborative word processing platform, where the teachers were encouraged to read the transcripts, ensuring they were a true and accurate account of what was discussed.

Documentation

A range of documents was collected and analysed during this research. These included electronic (email) communications and teacher developed plans and resources. Thomas (2009) suggested that "gathering data from documents represents an entirely different proposition from gathering data from people" (p. 170). When studying a culture, social setting or phenomenon, collecting and analysing the texts and artefacts produced and used by members can foster understanding (Silverman, 2001).

Electronic communication

With the continuing development of technology and its potential for communication, there has been an increase in the use of online data collection in social research (Parker, 2008), with many researchers using the internet and email as a method of engaging with respondents (Kralik, 2002; Parris, 2008). Using electronic communication such as email as a data source is advantageous since it saves time in transcription and is already marked with the time and date details (Parris, 2008). In this study, electronic communication occurred through both email and the Google Doc chat function. Email correspondence between the participating teachers, school executive (e.g. Principal and Deputy Principal) and the researcher throughout the study were used as sources of data. Conversations between the researcher and the participants provided within the Google Doc chat function were also used as data. The intent of collecting this chat data was that these illustrated the dialogue occurring throughout the process. It should be noted that the informal nature of the data collected through electronic communication provided the researcher with insight into some of the thoughts, experiences and perceptions of the study participants.

Teacher developed plans and resources

In this study, the unit plans and lesson plans were used as artefacts to measure and evaluate the teachers' ability to design educational experiences grounded within the GCA. These documents were prepared collaboratively during the planning and implementation phases (Phase B and C) of the PD model. The teachers were provided with a unit plan, lesson plan

and assessment proforma (see Appendix11, 12, 15 & 16) using the web-based application Google Docs. The use of Google Docs and consistent proformas assisted in scaffolding their planning and allowed the documents to be created, edited, stored and shared online. Privacy settings allowed only the relevant participants to be able to access the documents. The 'comments' features allowed a running dialogue throughout the process, even if the participants were not in the same space. All participants, including the researcher and expert body, could access these documents at any time. Throughout Phase B and C, one-unit plan, 10 lesson plans and one teacher and one peer assessment task were collected. A sample lesson plan is provided in Appendix 17.

Researcher reflection journal

As Creswell (2013) advocates, "Journaling is a popular data collection process in case studies and narrative research" (p.175). Thomas (2009) believes that keeping a diary or journal throughout the research process "is an invaluable data-gathering tool for the researcher" (p.166). In this study, the researcher kept a reflection journal, making a record of any observations, thoughts, feelings, actions, responses, conversations, that resulted from being engaged in the research process. Immediately after each session in the field, both following the lesson observation and teacher focus group interview, the researcher recorded a range of information in written form, using a reflection journal. The reflections recorded in the researcher's journal presented her own interpretations of the event and allowed a further perspective to be explored, not only as an expert but as an observer embedded in the process. The researcher noted down 27 reflections in her reflective journal. A proforma was used to gather the researcher's reflections, so that contextual information such as the time, date, venue and subjects could be recorded (see Appendix 18).

Post-teaching reflective analysis (PTRA)

The PDHPE teachers were provided with a post-teaching reflective analysis (PTRA) (Dyson, 1994) to individually reflect on the implementation of their GCA lessons. The PTRA involved seven questions or writing cues that invited the teachers to reflect on their goals for the lesson, how they met their goals, positive and negative aspects of the lesson any changes they would make, along with a reflection on the learning outcomes and goal setting for subsequent lessons (see Appendix 4). The teachers were asked to complete the PTRA after every lesson, recording their thoughts, reflection and evaluation of the lesson. As such, a total

of 11 reflections were collected. Each PTRA formed part of an ongoing reflection and evaluation of the intervention throughout the AR process. Additionally, as a result of the findings through the action research process following the initial needs assessment and planning phase, Meltzer's 'Tactical Games Teacher Benchmarks' elements were added to the reflective tool as an evaluation stimulus and to support learning in GCAs. The revised PTRA can be found in Appendix 19. The benchmarks directed the teachers to the patterns of teacher operations that should happen in GCAs. The teachers were encouraged to reflect on the teaching and learning strategies used within the lesson and how the students responded. The benchmarks were used so that both the teacher and the researcher could make a judgment on whether their teaching approach resembled that of a GCAs.

Lesson observations

Lesson observations were one of the primary methods of data collection during the implementation phase (Phase C). Creswell (2013) stated, "observation is one of the key tools for collecting data in qualitative research" (p.166). Observations in qualitative research involve taking detailed field notes on the behaviours and activities of individuals at the research site (Creswell, 2009). In this case, it involved taking detailed notes of the teachers' actions while delivering and of the students' actions as they engaged in the lesson. There are numerous advantages of using observations as a data source, for example, they provide a first-hand experience with the participants, information is recorded as it happens and the incident is recorded in its natural setting, allowing the research to observe a wide variety of aspects (Creswell, 2009; Gratton & Jones, 2010). Although, observations can also be intrusive for the participants and have problems associated with bias, particularly if the researcher becomes too actively involved (Bruns, 2000). The presence of the researcher may even affect the participants behaviour, or the researcher might misinterpret the situation (Burns, 2000; Creswell, 2009; Gratton & Jones, 2010).

Lesson observations were critical to this study, providing data concerning the teachers' implementation of the GCA. Observations were gathered through the implementation phase (Phase C) of this research. Each of the teachers' five lessons was observed. The researcher made detailed reflective notes during the observations of the teachers' lessons. These detailed notes allowed the researcher to gain and understanding of what elements of GCAs were being implemented and whether what was being delivered resembled game-centred practice.

Recording procedures for lesson observations

Recordings were made of the teachers' lessons in order to verify analysis later using the observational benchmark tool, where Meltzer's benchmarks were used as a verification of instructional processes, verifying that the teachers had implemented the model in the way it was designed. An iPad was set up on a tripod capturing the full view of each lesson, allowing both the teacher and students actions to be recorded. These recordings also helped deal with issues of bias due to the researchers' role in the research. The researcher was able to share the teachers' practice with the expert panel, gaining a second opinion on their GCA implementation and verifying her analysis using the benchmark tool. It also supported the sharing of practice with and between the teachers and allowed for a library of 'best practice' to be created for future and ongoing professional learning.

Phases of Data Collection

Data collection took place throughout four consecutive PD phases, as espoused within the PD model proposed within this research study. Each phase had a different educational focus and used different data sources aimed at contributing to understanding the overall aim of the study. The purpose of each data collection phase, data collection sources and timeframe are provided in Table 3.

Table 3. *Data collection phases, purpose and sources.*

Phase	Purpose	Data Source						Timeframe
		Focus Group Interview	Document Analysis	Lesson Observations	Teacher Reflections (PTRA)	Researcher reflections (journal)	E-mail correspondence	
Phase A:	Needs Assessment and Introductory Workshop: Introduce GCAs & establish a knowledge and understanding baseline for learning.	4: Sarah, Jenna, Fred, Barry, and researcher				13	8	Term 1, 2014 Week 4 - Week 11 (20th March – 11th April)
Phase B:	Planning/Designing: develop GCA unit overview and lesson plans	5: Sarah and Jenna (occasionally Barry) and researcher	1-unit plan 6 lesson plans (Sarah & Jenna) 1 teacher assessment 2 peer assessments			4	2	Term 2, 2014 Week 1 -3 (28th April – 16th May)
Phase C:	Implementation: implement the GCAs unit/lessons plans	4: Sarah, Jenna and researcher		5: Sarah 6: Jenna		8	11	Term 2, 2014 Week 4 - Week 10 (20th May – 28th June)
Phase D:	Lesson Evaluation: reflect on the effects of the unit and lessons for further planning and informed action	2: Sarah, Jenna and researcher			5: Sarah 6: Jenna	2		Term 2, 2014 Week 4 - Week 10 (19th May – 18th June)

Approaches to data analysis

The goal of qualitative data analysis is to discover emerging themes, patterns, concepts, insights, and understandings (Patton, 2002). In order to do this, a hybrid approach to data analysis was adopted, combining both inductive and deductive methods, as appropriated by the data collected. Guided by the AR process, data analysis was cyclical, focused on planning, action and fact-finding (Lewin, 1946). Similar to Casey and Dyson's (2009) study, data analysis occurred on three levels. The first phase of data analysis occurred immediately 'on the spot' whilst the teacher was planning or delivering their lessons. Due to the situated nature of the PD; since the researcher was embedded within the teachers' environment and she was able to identify and respond to the teachers learning needs as they emerged. The second phase of analysis involved the systematic collection and organisation of data, followed by the analysis using inductive analysis, deductive analysis and constant comparison (Denzin & Lincoln, 1994; Lincoln & Guba, 1985). Inductive analysis was conducted with all the data collection measures except for one data collection measure. Deductive analysis using a pre-designed observational benchmark tool was also used to analyse the data at this stage. The observational tool was designed using Metzler's (2011) 'tactical games teacher benchmarks' as a checklist, to analyse the unit and lesson plans and lesson observations. Both inductive and deductive forms of analysis were chosen in order to provide a more complete understanding of the teachers' needs. The majority of data collected allowed for an open analysis, allowing the researcher to explore the complexity of PD and the associated needs of the teachers. Deductive analysis was used to examine the specific elements of the PD that aligned with the instructional approach of GCA. The deductive analysis provided a means of supporting and verifying the inductive analysis. As such, findings from these analyses were grounded in the specific context of the action research process; where the researcher was able to identify the teachers learning needs through the 'on the spot' analysis and make subsequent changes to the PD, ensuring the teachers' needs were met and their implementation of GCAs was supported.

The third phase of analysis engaged the teachers in the analysis process, where the teachers were encouraged to reflect on their teaching and identify their own specific needs. Engaging the teachers in the analysis process allowed for changes to be made to teaching practice and provided additional time for reflection and observation if it was required. This interpretive approach to data analysis enabled the teachers' voices to be described and interpreted throughout each phase of the action research cycle and the entire PD process. Having the

teachers' voice present through the process is important with qualitative research, particularly research within this theoretical framework where the aim is to empower teachers to learn in their professional context. The final level of analysis involved peer briefing with the expert body and triangulation of the data. The researcher and the expert body analysed and discussed the data both at the time of the research and during the writing of this paper.

Inductive analysis and constant comparison

Inductive analysis and constant comparison of qualitative data combine category coding with a simultaneous comparison of all 'units of meaning' obtained (Glaser & Strauss, 1967). Inductive analysis is the method of coding data without trying to fit it into a pre-existing coding frame or the researcher's analytic preconceptions (Nowell, Norris, White, Moules, 2017). As such, this form of thematic analysis is data-driven (Braun & Clarke, 2006) and theory generating. Inductive analysis aims to "systematically generate theory grounded in specific instances of empirical observation" (Thorpe & Holt, 2008, pg. 112). The patterns, themes, and categories of analysis "emerge out of the data rather than being imposed on them prior to data collection and analysis" (Patton, 1990, p. 390). The theory emerges from the data in the first instance. Then the next data set is evaluated and compared with reference to the emerging theory. Each round of data collection was compared and analysed with reference to the tentative theory. Constant comparison provides the opportunity to identify relationships in and across data, and to organise findings into themes. Holton (2007) states, "the purpose of constant comparison is to see if the data support and continue to support emerging categories" (p.277). Glaser and Strauss (cited in Lincoln & Guba, 1985, p. 339) identify four distinct phases to the constant comparison method. These include:

1. comparing incidents applicable to each category,
2. integrating categories and their properties,
3. delimiting the theory, and
4. writing the theory. (Lincoln & Guba, 1985, p. 339)

According to Dye, Schatz, Rosenberg, and Coleman (2000) "as social phenomena are recorded and classified, they are also compared across categories. Thus, hypothesis generation (relationship discovery) begins with the analysis of initial observations" (p.2). The process undergoes continuous refinement throughout the data collection and analysis process. This study closely followed these guidelines when analysing the data.

Deductive analysis using the observational Benchmark tool

In direct contrast to inductive analysis, deductive analysis is driven by the researcher's theoretical or analytic interest, where a conceptual and theoretical structure is pre-constructed and is tested through, observation, providing a more detailed analysis of some aspect of the data (Braun & Clarke, 2006). A deductive approach was used in this study to analyse the teachers' unit and lesson plans in the planning phase and their lesson delivery in the implementation phase. The researcher's analytical interest in this case, was focused on verifying the GCA lessons and observing the teacher's implementation of GCAs. In a deductive approach, the themes and codes are pre-selected, in the case of this study, this was done using Metzler's (2011) 'tactical games teacher benchmarks', which were used to design an observational benchmark tool, providing a verification measure of instructional processes. The deductive analysis provided a means of informing and supporting or refuting the emergent themes identified within the inductive analysis.

Observational benchmark tool

The observational benchmark tool designed using Metzler's (2011) 'tactical games teacher benchmarks' was used to deductively analyse the teachers' unit plans, lesson plans in the planning phase and their lesson delivery in the implementation phase. The benchmark elements presented a verification of the instructional processes required for implementing games-centred practice and present an analysis of the teachers' fidelity to GCAs. Given this, the observational benchmark tool was used to measure the degree to which the teachers' instruction was consistent with the acceptable standards of the GCA. As such, the analytical tool presented a way to explore the variation and the degree to which pedagogical elements or the GCA instructional processes are demonstrated during teaching practice and the differences in implementation between elements and teachers. In addition, analysis using the observational benchmark tool provided a lens through which to assess and make a judgment on teacher PCK of the GCA.

Deductive analysis using the observational benchmark tool was conducted on the teachers' unit and lesson plans, and the teachers' delivery of their planned lessons. Copies of the unit and lesson plans were obtained from the teachers and analysed by the researcher, who examined their content and cross-checked them against Metzler's (2011) 'Tactical Games

Teacher Benchmarks' using the observational benchmark tool before being implemented. During the implementation phase, the teachers' lessons were observed by the researcher and recorded. Recording the teachers' lessons allowed the researcher and the expert body to able to review the teachers' lessons after the lesson had been conducted. Having the lessons recorded enabled the researcher to support the teachers 'on the spot' during the lesson, if they needed, also allowing her to reflect on the observations being made.

Analysis using the benchmark tool involved coding with checkmarks being placed under one of the following criteria 'present, 'present to a lesser degree', or 'not present' associated with one of the eight selected GCA benchmarks (Gurvitch et al., 2008; Harvey et al., 2016) (see Appendix 20). Table 4 illustrates the specific pedagogical behaviours or GCA instructional processes observed and coded in the teachers' unit plans, lesson plans and through observation of the teachers' lesson delivery. Table 4 also shows the specific behaviours the researcher was looking for through the teachers planning and implementation. The expert body reviewed the recorded footage of the lessons and validated the researcher's analysis using the benchmark tool. Guided by research into the implementation of models-based practice conducted by Stran, Sinelnikov and Woodruff (2012), a compliance measure was calculated in percentages for each individual benchmark element in addition to the simple 'present', 'present to a lesser degree' and 'not present' (see results tables 9-12) observation. The compliance measure helped to provide a clearer picture of the fidelity of validation. An overall compliance measure, observing the authentic implementation or whole model fidelity, as was also recorded. Analysis using the observational benchmark helped identify areas of success or strength when implementing the GCA and the specific areas where the teachers struggled and needed further support to implement the GCA successfully and authentically.

Whilst initially used as an analytical tool for the study purpose, the observational benchmark tool was also used as a feedback and reflective tool, informing and the development of the teachers' capacity to implement GCAs as part of the PD. The teachers were encouraged to use the observational benchmark tool when reflecting on their own lesson. This analysis provided feedback on the teacher GCA implementation fidelity. This feedback was then used to support subsequent lesson planning and delivery, plus provided a means to support the teachers' critical reflection and their subsequent learning. The observational benchmark tool enabled the researcher to identify differences in implementation and the variation in the degree of which pedagogical elements were demonstrated in teacher practice. Analysis using

the observational tool presents a way to explore the variation and the degree to which pedagogical elements or the GCA instructional processes are demonstrated during teaching practice and the differences in implementation between elements and teachers.

Analysis using the observational benchmark tool provided a means to determine the impact of the PD program. If more GCA elements were presented, it was believed to reflect an improvement in teacher capacity, or more specifically, the teachers' knowledge. This, in turn, was deemed a success of the PD, highlighting possible facilitators in the PD process. In the instance of no gain in capacity or teacher knowledge, possible barriers were identified or reinforced within the PD process.

NVivo

A qualitative computer program, NVivo (QSR International, 2010) was used to assist with data management and analysis. NVivo software allowed the data to be organised, coded and analysed efficiently and effectively, allowing insight to gained and theory to be generated. NVivo 9 was the software package used for this study. Using computer software such as NVivo can be advantageous, offering an accessible, organised storage file system, helping researchers locate material quickly, retrievable memos and eliminating the elaborate colour coding system (Creswell, 2013). Flick (2009) suggests, "using computer programs has made the use of analytic techniques such as theoretical coding more explicit and transparent" (p. 370), "leading to more transparency about how the researcher has developed categories from the analysed text and applied them to it" (p.370).

The analyses process

At the end of each data collection day, the researcher transcribed all interview data and imported all data files including the teacher reflections (PTRA), researcher reflections, email correspondence and chats, as a data source into NVivo (QSR International, 2010). Importing the data into Nvivo allowed the data to be prepared and organised ready for analysis. In order to familiarise herself with the data, the researcher read through each data source entered into NVivo several times, gathering ideas about what is in the data and what is interesting about them (Braun & Clarke, 2006; Nowell, Norris, White, & Moules, 2017), before beginning coding data into 'incidents' (Glaser and Strauss, 1967) or 'units' (Lincoln and Guba, 1985) and categories or 'nodes' in NVivo.

Coding data into themes

The next step of the analysis involved coding the data into themes or 'units of meaning' (Glaser & Strauss, 1967). Coding the data is essentially a "theorizing activity that requires the researchers to keep revisiting the data" (Nowell, Norris, White, & Moules, 2017, p.5). The coding process allows the researcher to simplify the data and focus on specific characteristics, organising and conceptualising the data (Dey,1993) to develop ideas about what is going on in the data (Morse & Richards, 2002). Sections of text deemed important were highlighted in NVivo and a code assigned, forming a node. Guided by the work of Braun and Clarke (2006), the researcher worked systematically through each data source, analysing the data line-by-line, giving full and equal attention to each data item, identifying interesting aspects in the data items that informed the themes across the data set. Patton (1990) explains this process of uncovering patterns, themes and categories as a "creative process that requires making carefully considered judgments about what is really significant and meaningful in the data" (p.406). NVivo allowed the data to be coded in multiple themes, using a colour coding system.

Table 4: Demonstration of the tactical games' teacher benchmarks during the unit

Benchmark elements	Unit Plan/Lesson Plan	Implementation
1. Creating a tactical problem as the organising centre for learning tasks,	Checked unit/lesson plans to make sure tactical problems were written out.	Observed teacher set a tactical problem to be solved in the lesson
2. Teacher begins unit segment with a game form to assess student knowledge,	Checked unit/lesson plan.	1. Observed unit/lesson commences with a game form. 2. Observed small-sided and modified games used within the lesson.
3. Teacher identifies needed tactical and skill areas from game form,	PTs wrote tactical areas that needed improvement in lesson plans	1. Observed teacher identify areas of success/improvement during lesson 2. Observed teacher modify/adapt games for students to experience success/challenge
4. Teacher uses deductive questions to get students to solve the tactical problem,	Checked unit/lesson plan.	Recorded questions asked and students' responses.
5. Teacher uses clear communications for situated learning tasks,	Checked unit/lesson plan – key teaching points are included.	1. Observe students as they organise each task. 2. Students set up and engaged in the task according to the teacher's directions.
6. Teacher uses high rates of guides and feedback during situated learning tasks	Checked unit/lesson plan – possible student responses are included	Recorded the content and the frequency of the teacher instructional interactions.
7. Teacher provides a review that includes the tactical problems of the lesson.	Checked unit/lesson plan.	Recorded the number of times teacher checks for understanding at the end of each lesson.
8. Assessment.	1. Checked the teacher's unit and lesson plans. 2. Checked the Assessment task proforma given to students	Reviewed teacher process and game play assessments

Comparing data

After each day and cycle of data collection, the researcher repeated this data analysis process, entering the new data sources into NVivo, then analysing that data. Data were compared across data collection cycles, days and data collection measures (e.g. reflections, interviews), along with the themes already theorised, or creating new themes to accommodate new ideas. Like data was grouped with like data under the same theme, NVivo permits this by allowing the data to be assigned to the same node. The continuous process of data collection and data analysis required the ongoing sorting and coding of data, refining the themes and then organising data into categories. The coding process provided interpretations from raw data with which to make comparisons, conclusions, and determine the significance of events in subsequent data collection sessions (Patton, 2002).

The method of constant comparison provided opportunities to identify relationships in and across data and to organise findings into categories or major themes. Holton (2007) states, "the purpose of constant comparison is to see if the data support and continue to support emerging categories" (p.277). The coded data within each theme was subsequently developed into major themes or categories as relationships between the data were observed, "data is organized by grouping like with like: data bits with data bits" (Dye, Schatz, Rosenberg, & Coleman, 2000, p.3). Organising and categorising the data was done in NVivo by coding and labelling data into nodes, forming 'parent nodes' with the overarching category, and 'child nodes' with the initial themes (see Appendix 21). Examples of parent nodes which emerged included 'needs', 'current practice' 'existing knowledge and understanding' (see Table 5 & 6). Data could then be subdivided into relevant child nodes. Lempert (2007) explains, codes capture patterns and themes and cluster them under a 'title' that induces a collection of impressions and analyses for the researcher; and uses category as a higher-level code that as grown in complexity and abstraction, so subsuming other codes. Tables 4 and 5 show the emerging major themes or categories and their relationships with the sub-themes and raw data. At this stage of analysis, Lincoln and Guba (1985) advise researchers, "devise rules that describe category properties and that can, ultimately, be used to justify the inclusion of each data bit that remains assigned to the category as well as to provide a basis for later tests of replicability" (p. 347). The memo function was used in NVivo to describe the category properties.

Table 5: Emerging categories and sub-categories included within each following the inductive analysis

Category (Parent node)	Subcategory theme 'unit of meaning' (Child node)
Teacher needs	Lesson observation
	Planning support
	Resources
	Overview of progression (unit)
	Contextual PD – using students
Current teaching practice	Skill based
	Team teaching
	Focus on invasion games
Existing knowledge of GCAs	Game categories
	Modified games
	Questioning

Table 6: Raw data examples from emerging themes and sub-categories included in theme: Existing knowledge of GCAs

Raw data	Sub-theme	Major theme
"Striking and Fielding, Net and Court and Target, is that the fourth one?... Whenever I have seen or heard about GCASs it has always only been with invasion games. So, I would have no idea how to do it for instance for striking games" (Sam, teacher interview, 28 March 2014).	Game categories	Existing knowledge of GCAs
"I see it as modified games, leading up to the big games… Skill based things using the game" (Fred, Teacher Interview 1, 20 March 2014).	Modified games	
"So, you're doing a skill centred approach and then you're asking the kids questions, throwing them into some sort of a game or activity" (Jenna, Teacher Interview, 28th March 2014).	Questioning	

Reviewing themes

Once all data from each phase of the PD process had been entered, the researcher then refined the themes. Having a big picture view of the analysed data helped the research to gain a good understanding of all the different themes and how they fit together, and the overall story they

tell about the data (Braun & Clarke, 2006; Nowell, Norris, White, & Moules, 2017). Reviewing the themes requires the researcher to "review the coded data extracts for each theme to consider whether they appear to form a coherent pattern" (Nowell, Norris, White, & Moules, 2017, p.9). Nowell, Norris, White, and Moules (2017) suggest that the validity of individual themes determines whether the themes accurately reflect the meanings evident in the data set as a whole. In reviewing the themes, some of the themes did not have enough data to support them, an issue Braun and Clarke (2006) suggest this is not uncommon. Rather than discard these themes, the researcher tried to see if the data matched any other coded themes. The researcher attempted to refine the themes, so they were are specific enough to be discrete, and broad enough to capture a set of ideas contained in numerous text segments (Nowell, Norris, White, & Moules, 2017). This helped the researcher to clarify how the theme was derived from the data (as shown in tables 4 & 5).

Phases of Data Analysis

The simultaneous data collection and data analysis process was conducted throughout each phase of the PD process, that is, the needs assessment, planning, implementing, evaluating phases, with different data sources used more predominantly in different phases of the research. An overview of the data source and subsequent analysis can be seen in Table 7.

Table 7. *Data source and analysis conducted*

Data source	Data Analysis
1. focus group interviews	• Inductive analysis & constant comparison
2. email correspondence	• Inductive analysis & constant comparison
3. teacher reflections (PTRA)	• Inductive analysis & constant comparison
4. researcher reflections (journal)	• Inductive analysis & constant comparison
5. unit plan	• Deductive analysis - Observational Benchmark Tool
6. lesson plans	• Deductive analysis - Observational Benchmark Tool
7. lesson observations	• Deductive analysis - Observational Benchmark Tool

Trustworthiness

Trustworthiness in qualitative research parallels the quantitative criteria of validity and reliability. Nowell, Norris, White, and Moules (2017) suggest, that in order for qualitative research to be accepted as trustworthy, "researchers must demonstrate that data analysis has been conducted in a precise, consistent, and exhaustive manner through recording, systematizing, and disclosing the methods of analysis with enough detail to enable the reader to determine whether the process is credible" (p.1). This study uses Lincoln and Guba's (1985) guidelines of credibility, transferability, dependability, and confirmability to demonstrate trustworthiness within this study.

Credibility

Credibility is concerned with the truthfulness or 'truth-value' of the research findings (Lincoln & Guba, 1985). Credibility ensures that the research findings are not distorted, showing that the findings presented are a correct interpretation of the original data and the participants' original views (Korstjens & Moser, 2018). Lincoln and Guba (1985) identify a number of techniques to address the credibility of research, these include activities such as prolonged engagement, persistent observation, triangulation, peer debriefing, negative case analysis, referential adequacy and member checking (see pages 301-316). The strategies employed to ensure the credibility of the findings within this study are presented below.

Prolonged engagement

Prolonged engagement requires sufficient time to be spent in the field of research to become familiar with the context and setting, giving the researcher time to test for misinformation and to build rapport and trust, ensuring the researcher gets to know the data and gathers rich data sets (Lincoln & Guda, 1985, Korstjens & Moser, 2018). In this study, the researcher spent six months immersed in the research setting from March through to September. The nature of the action research meant that the researcher was immersed in the research process, engaging with the faculty members and students, joining in with lessons and supporting the teachers where there was perceived need. Being immersed in the research process allowed rapport and trust to be built with the study participants and the students within their classes.

Persistent observation

Lincoln and Guda (1985) advise persistent observation, focusing on the characteristics and elements that are pertinent to the problem and issue being explored. The continuous and ongoing nature of the data collection and data analysis ensured that the teachers' lessons were consistently observed, and data was continuously collected and analysed, making meaning of the findings. The observational benchmark tool ensured that the researchers' observations were focused on the relevant behaviours required to implement GCAs.

Triangulation,

Creswell (2013) states, "When qualitative researchers locate evidence to document a code or theme in different data sources, they are triangulating information and providing validity to their findings" (p. 251). It is argued that triangulation improves the internal validity of research and contributes to removing bias or distorting the findings (Burns, 2000). Lincoln and Guba (1978) refer to three methods of triangulation, including, using different data sources, investigators and methods of data collection. In this case, data and method triangulation was employed, where multiple data sources and multiple methods of data collection, for example, observation, interview, reflections, was used at different periods and from different teachers.

Peer debriefing

Peer debriefing ensures credibility by providing an external check of the research process (Creswell, 2013). Lincoln and Guba (1985) explain peer debriefing as "a process of exposing oneself to a disinterested peer in a manner paralleling an analytical session and for the purpose of exploring aspects of the inquiry that might otherwise remain only implicit within the inquirer's mind" (p. 308). Peer debriefing occurred with the expert body throughout the PD process. Data were continuously collected and analysed and checked with the expert body of Physical Education Teacher Education academics. Checking with the expert body held the researcher accountable for any bias or posture toward the data and analysis. As Lincoln and Guba (1985) suggest, the expert body played 'devil's advocate', keeping the researcher honest and asking the hard questions regarding the methods, what the data means and her interpretations of the data.

Negative case analysis

Creswell (2013) suggests, "not all evidence will fit the pattern of a code or theme" (p.251). In qualitative research Morse (2007) suggests, "negative cases, or participants who have not responded in the anticipated way, or who have opposite reactions to the majority to a particular phenomenon" (p. 240). Negative cases were not discarded; rather, they were integrated into the emerging theory. As such, a search for negative cases was undertaken to ensure the researcher had not overlooked important ideas and included outliers (Lincoln & Guba, 1985). A search for negative cases was done by running a coding query in NVivo. The coding query in Nvivo allowed the data to be searched for elements that did not support or appeared to contradict patterns or themes that were emerging from the data. Any negative cases were discussed until they could be explained in the context of the results.

Member checking

Lincoln and Guba (1985) suggest that credibility can also be enhanced through the process of member checking with the participants to test the findings and interpretations. Member checking is where the "researcher solicits participants' views of the credibility of the findings and interpretations" (Creswell, 2013, p. 252). Member checking was conducted informally with the teacher participants whereby they were provided with access to the data gathered through a collaborative Google Docs. Member checking with the teacher participants allowed transparency and sharing of the findings, giving the teacher participants access to view the data. Interviews were transcribed and shared, for the teachers to check what had been written.

Transferability

Transferability refers to the generalisability of inquiry (Nowell, Norris, White, & Moules, 2017), showing how the findings of qualitative research can be applicable to other contexts and settings. In case study research such as this, transferability is problematic. Thus, in qualitative studies of this nature, transferability concerns only case-to-case transfer, "Qualitative inquirers need to recognize that the comparable 'external validity' is substantially different in qualitative inquiry, as there is no single correct or 'true' interpretation in the naturalistic paradigm" (Tobin & Begley, 2003, p.392). As such, the researcher is responsible for providing rich descriptions to allow readers to make decisions

regarding transferability (Creswell, 2013, Lincoln & Guba, 1985). Rich and thick descriptions were provided of the school setting, the teacher participants and the researcher via their biographies (see appendix 5, 6 & 3), describing in detail the context of the study, enabling the reader to transfer information to other settings and determine whether or not the findings can be transferred (Creswell, 2013).

Chapter Conclusion

This chapter has reported and justified the research methodology selected for this study. The procedures adopted for data analysis have also been outlined. The research utilised a qualitative approach based on a case study of an action research process used to gather and analyse data, to enable a more complete understanding of the factors that need to be considered when designing PD to support teachers' implementation of an innovative pedagogical approach, in this case, GCAs. The qualitative methods for collecting data included teacher interviews, lesson observations, and document analysis and teacher reflections. This chapter also provided a framework for the conceptual PD model used within the study, providing an overview of the four phases of PD (i.e. needs assessment, planning, implementation, evaluation) and the associated PD components that were central into the PD process (i.e. situated learning, collaboration, capacity building, active/practical learning, reflective, ongoing support).

Chapter 5

FINDINGS

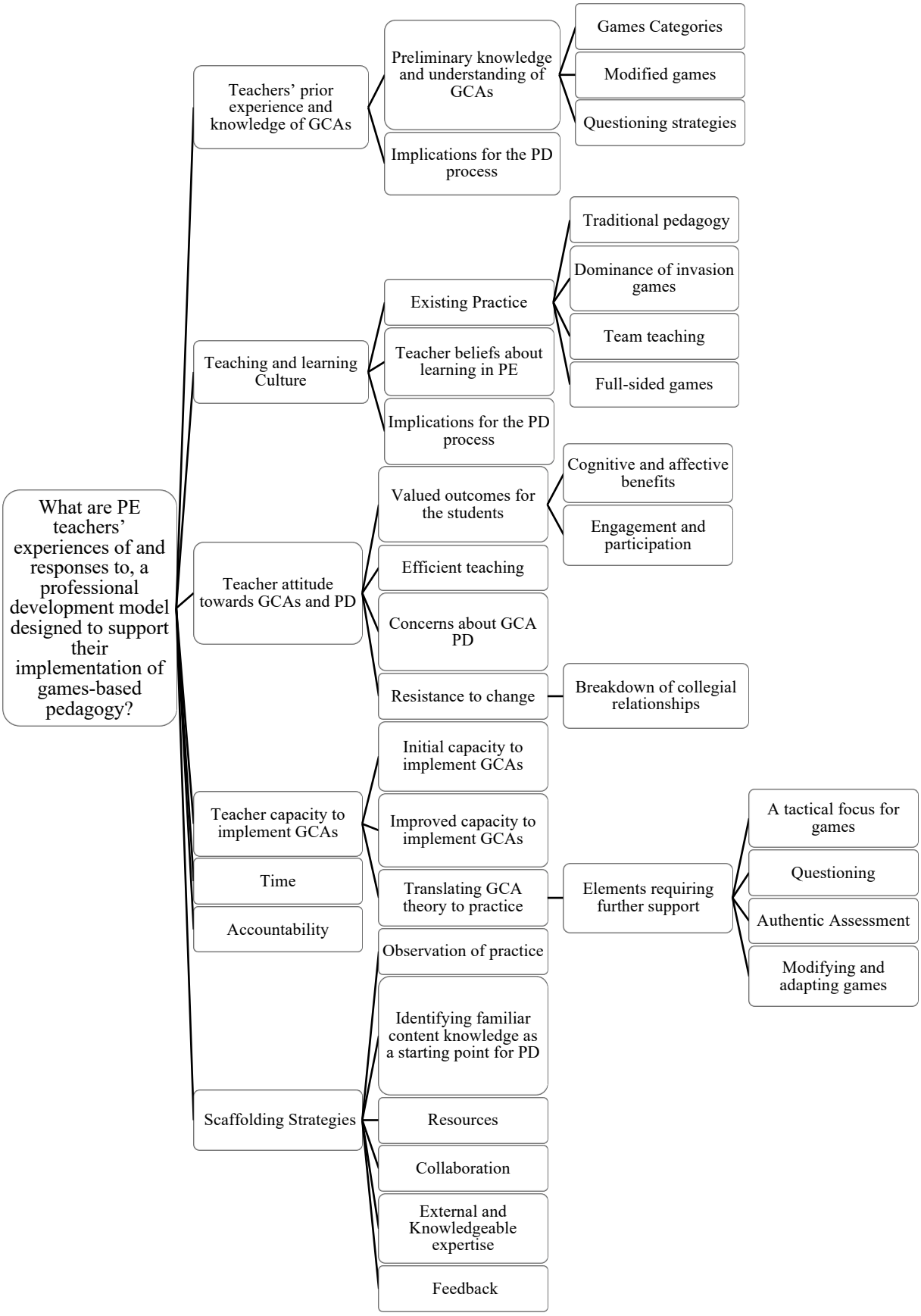
Introduction

The findings presented within this chapter are focused on the overarching research question, 'What are Physical Education (PE) teachers' experiences of and responses to a professional development model designed to support their implementation of games-based pedagogy?' and the three secondary research questions,

I. 'What barriers and facilitators impact on teacher professional learning when implementing Game Centred Approaches (GCAs)?
II. What elements of games-based pedagogy do teachers need support with when learning to teach GCAs? and What are the characteristics of effective Game Centred Approach Professional Development (GCA-PD)?
III. What are the characteristics of effective GCA-PD?

An understanding of what the teachers needed to know and understand in order to improve their capacity to design and implement GCAs was presented. A clear image of the teachers professional learning needs throughout the different stages of the Professional Development (PD) process emerged which was used to guide and tailor the PD process, informing the scaffolding used to support the teachers' capacity to implement GCAs. This section synthesises the findings across the four phases of the PD process according to the main and salient themes that emerged from the data analysis. These are presented in Figure 7 below.

Figure 7. *Summary of research theme*



Teacher participant withdrawal

It is important to note that despite all teachers agreeing to commit to the study and signing all relevant consent forms, only Jenna and Sarah participated in the study through all phases of the professional development and action research process. Barry withdrew early from the study after the needs assessment phase and Fred withdrew from the study during the planning phase. Despite not participating in all phases, the data gained during Barry and Fred's participation provided significant data and made a valuable contribution to the findings. Table 8 below shows the participants and their participation throughout the PD process.

Table 8. *Participant involvement in PD phases*

Participant Name	Phase A: Needs Assessment	Phase B: Planning	Phase C: Implementation	Phase D: Evaluation
Jenna	✓	✓	✓	✓
Sarah	✓	✓	✓	✓
Barry	✓	Withdrew participation	X	X
Fred	✓	Still involved but did not participate	Withdrew participation	X

Informing the Professional Development process

The findings are presented to demonstrate how the cyclical AR process of 'taking action', 'doing research', and 'telling the story' and sharing the findings (McNiff & Whitehead, 2009) were evident in this study. The findings from each phase of the PD process were used to guide and tailor the PD to accommodate teachers' needs and build their capacity to implement GCAs. In this way, the AR process provided support and coherence between the teachers' needs and the PD provided; thus, ensuring the PD was 'relevant', 'applicable' and aligned to teachers' educational goals and learning needs (Armours & Yelling, 2004, 2007). As such, the findings are presented to show how the teachers' and researcher's learning and actions were monitored, the teachers' needs accounted for and how the PD process was subsequently guided and tailored to the teachers' individual needs to support their capacity throughout the action research process.

The findings showed the needs-assessment to be an essential phase in establishing a starting point for the personalisation of the PD. Findings from this initial phase were key in informing

and guiding the PD process, whereby the PD was designed to account for the teachers' needs, supporting the teachers and building their capacity throughout the following planning and implementation phases. Metzler's (2011) Benchmark elements were utilised in identifying GCA-specific areas in which teacher capacity could be developed and informing the focus of learning throughout the PD process. As such, these benchmark elements became a framework for scaffolding the teachers' learning and designing the PD. Analysis using the observational benchmark tool provided a means to determine the impact of the PD program on the teachers' actions (e.g. implementation).

There were some commonalities between the teachers' needs, whilst other factors were quite different, indicating a need to personalise the PD process. The AR process enabled these needs to be exposed and what emerged was a personalised and tailored PD process. As the PD evolved, specific facilitators were engaged but others not, evident barriers were either still in place, weakened or removed or in some cases even reinforced, as were aspects of the teachers' pedagogical content knowledge associated with GCAs. The overall need to willingly engage with the PD and actively participate in the Professional Learning Community (PLC) also emerged, along with the need to have a person driving the GCA philosophy and approach to PD. It is important to note, that despite Barry and Fred's withdrawal from the study, and no one holding the group accountable to the PD process or their engagement in the PLC both Jenna and Sarah remained positive in relation to the PD, engaged in the PLC and strove to improve their teaching skills.

Teachers' prior experience and knowledge of Game Centred Approaches

Early findings from the needs-assessment revealed that the teachers had limited previous experience with innovative approaches such as GCAs. The teachers commented that before this study, they had not undergone any PD that included GCAs, nor had their Physical Education Teacher Education (PETE) experiences exposed them to games-based pedagogy or alternative approaches to teaching games and sports. Sarah, the youngest member of staff, had revealed that she had undertaken one TGfU unit within her University studies but had limited to no exposure to GCAs or experience using GCAs in her teaching experience after graduating. The other teachers' University experience had not introduced them to game-based pedagogy. Rather it had reinforced the need for lessons to be developed around technical and skill-based instruction, and mass practice. Fred commented, "I guess, when I went through Uni' it was all about doing skills through the drills and adding variables slowly

etc. until you got to play a full game (Fred, Teacher interview, 20 March 2014). Likewise, Barry stated, "I was [attended University] the late 90's, very much a focus on setting the basic skills in motion and add variable until you get into a game" (Barry, Teacher interview, 20 March 2014). The following focus group conversation further illustrates the teachers' limited experience of GCAs:

Researcher: So, what experiences of GCAs do you think you have had?

Fred: Ahhh not much.

Researcher: I know you [Sarah] have said you did some stuff when you were in Uni.

Sarah: Yeah, we did but not much, but in like some lessons I will do a game like approach because it is that one game I like to do, like End ball, kind of like Frisbee in a way like you have to catch a ball in the end zone

Fred: I guess, when I went through Uni' it was all about doing skills through the drills and adding variables slowly etc. until you got to play a full game.

Researcher: Have you had any professional learning for PE, professional development offered that you have gone on?

Sarah: No.

Fred: Nah.

(Focus group Interview 1, 20 March 2014)

Findings from the initial conversations seemed to indicate that engagement within PD was limited over the previous years. These findings are surprising since all three of the experienced teachers, Jenna, Barry and Fred, were teaching during the implementation of the preceding PDHPE syllabus released in 2003 (Board of Studies NSW, 2003) where games-based pedagogy was explicit and the preferred pedagogy in the syllabus. The syllabus outcomes (Board of Studies NSW, 2003) highlighted the need for students to be cognitively involved in games, whilst the learning progression from Stage 4 to Stage 5 required greater critical thinking and solving of more complex tasks (Pearson, Towns, Webb & Rowland, 2004).

Following the release of the 2003 PDHPE syllabus (Board of Studies NSW, 2003), there were numerous opportunities for teachers to engage in traditional PD opportunities designed to

support the teachers to understand the requirements of the 2003 syllabus and translate these requirements into teaching practice.

Thus, it is interesting that the teachers did not take part in any of these PD workshops or possibly recognise these PD opportunities to learn GCAs. The teachers' unfamiliarity and inexperience with GCAs could also indicate that the PD was ineffective in supporting the teachers to identify the GCA elements in the syllabus and embed the GCAs pedagogy in practice. These findings raised questions surrounding the level of engagement in PD opportunities.

Preliminary knowledge and understanding of GCAs

Predictably with the teachers' limited exposure to innovative pedagogies such as GCAs, the findings revealed that the teachers' preliminary knowledge and understanding associated with games-based pedagogy was superficial. The teachers limited preliminary knowledge of GCAs was particularly evident when measured against Metzler's (2011) benchmark elements. Analysis of the teacher interviews showed that the teachers' knowledge and understanding of GCAs were limited to some structural features such as the game categories and the teacher's role in GCAs. In addition, the teachers were able to identify some key GCAs elements such as modified games and questioning strategies. However, some misconceptions of GCAs were detected from the teachers' comments. The needs-assessment phase proved vital in setting up the PD, since it provided a starting point, identifying the teachers' preliminary knowledge and understanding of GCAs subsequently informing the PD, tailoring it for the individual teachers' needs.

Games Categories

Sarah demonstrated some understanding of the game categories associated with GCAs, where she was able to identify the four games categories. Sarah identified, "Striking and Fielding, Net and Court and Target, is that the fourth one?" along with some of the reasoning behind grouping sports into these categories, suggesting "I would say for the different skills… or the different concepts you want them to learn" (Sarah, Teacher interview, 28 March 2014). However, her content knowledge was mostly limited to invasion games, she notes, "Whenever I have seen or heard about GCAs, it has always only been with invasion games. So, I would have no idea how to do it for instance for striking games" (Sarah, Teacher

interview, 28 March 2014). These findings are not surprising since the previous findings and the research show the dominance of invasion games in the PE curriculum (Butler, 1993; Jones & Williamson, 1983). The other three teachers had limited understanding of the game categories associated with GCAs; Barry states, "I've heard the titles, but I don't know much about them" (Teacher interview, 28 March 2014) which was reinforced by Jenna. The current practice involved the teachers, teaching in isolated sports, "we don't teach in games categories here, we teach in sports" (Jenna, Teacher interview, 28 March 2014). The researcher was surprised by these findings, particularly since the 2003 NSW PDHPE syllabus (BOSTES, NSW, 2003) references explicitly these games categories and requires students to learn to "demonstrate movement skills through a range of experiences including games from categories such as target, striking/fielding, invasion and net/court" (P.24).

Modified games

The teachers were able to identify key elements indicative of GCAs such as the use of modified games and questioning, along with the facilitating role of the teacher, although this was quite superficial. For example, Fred explained, "I see it as modified games, leading up to the big games… Skill based things using the game" (Fred, Teacher Interview 1, 20 March 2014), whilst Barry explained "It's just a move away from mass practice to start a game and then use questioning" (Barry, Teacher Interview 1, 20 March 2014). Similarly, Jenna suggests, "So you're doing a skill centred approach and then you're asking the kids questions, throwing them into some sort of a game or activity" (Jenna, Teacher Interview 2, 28th March 2014). Sarah comments on her implementation of games-based pedagogy through her 'End ball' games, noting,

> I like to do a game like approach because it is that one game I like to do, like 'End ball'; kind of like frisbee in a way like you have to catch a ball in the end zone and I often stop it and say ok how can we improve, what is working for your team and what is, ask 'How can we improve'. I often stop change the ball up and do things like that and add rules as I go along and that is a very game centred approach, but I don't do that in all of my lessons.
>
> (Sarah, Teacher interview, 20 March 2014)

Sarah showed some knowledge and understanding of GCAs, and some elements of games modification around changing rules and equipment. However, this was somewhat superficial and perhaps indicative of previous PD or engagement in it from a learner's perspective at University.

Questioning strategies

Questioning in GCAs need to go beyond simple yes/no questions, to using more open-ended questioning that fosters debate and dialogue with teachers and between learners (Gréhaigne, Richard, & Griffin, 2005; Harvey & Light, 2015; Kidman, 2001). Questioning needs to facilitate higher-order thinking and discussion about tactics and strategies (Webb & Pearson, 2008). The findings show that the teachers demonstrated some understanding of the questioning strategies associated with games-based pedagogy, although this was quite elementary and did not move beyond the use of close-ended questions, that focused on game rules and skills performance. For example, Jenna explained, "asking them did you achieve your goal, if your goal was to get ten passes before you got to the line, did you achieve it? If you didn't get to the line before your ten passes what went wrong, the ball, you dropped it, I can't catch" and questioning based on skill execution such as "how to throw a ball, how to throw a ball while a person is moving, the direction and the speed you need to use to get it there" (Jenna, Teacher interview, 28 March, 2104). Sarah was able to add some elements around game performance, commenting, "I often stop it [the game] and say ok how can we improve, what is working for your team and what is, ask 'How can we improve'" (Sarah, Teacher interview, 20 March 2104). Jenna was also able to identify the shift in the role of the teacher in GCAs, perceiving them as a "facilitator in the delivery" and an "organiser for the planning" (Teacher interview, 28 March 2014), reflecting the GCA research of Griffin and Butler (2005). They suggest that GCAs "highly value the role of the teacher as the facilitator" (Griffin & Butler, 2005, p.1).

In reflecting on his current knowledge and understanding of GCAs, Fred noted he had minimal understanding of what these features looked like in practice, stating,

> Researcher: So last week you were talking about your understanding of Game Centred Approaches as modified games and questioning, what do you think these modified games look like?

Fred: I don't know. I have got zero idea. I'll tell you, I have got zero idea of what it will look like, to be brutally honest, I don't think I could tell you what it looks like.

Researcher: So, in terms of the questioning, do you have any idea what the questioning would look like?

Fred: Not really, I know it is going to be great, I know it will be good.

(Teacher Interview 2, 28 March 2014)

The teachers' preliminary knowledge and understanding of GCAs was relatively superficial and in some instances represented a misunderstanding of games-based pedagogy and the concept of 'playing games'. Analysis using the observational benchmark tool in the initial unit planning phase revealed that only two of the eight benchmark elements were addressed in the teachers' initial unit overview (see Table 9), reinforcing the teachers limited preliminary knowledge and understanding of GCAs in the initial PD phases. These findings support that the teachers had limited prior exposure to GCAs; they were unfamiliar with games-based pedagogy and what it looked like in practice.

Implications for the PD process

The findings illustrated how the teachers within this setting attempted to place GCAs in their own framework of teaching. The teachers viewed GCAs through their own lens of what teaching should be, established their own beliefs and assumptions about teaching and learning and how the culture within the faculty influenced their educational ideas. That is, the teachers' understanding of GCAs was placed in a framework of a traditional approach, highlighting their limited exposure to GCAs and possibly indicating that any prior PD may not have influenced their practice. Interestingly, these findings show that the teachers were starting from a place of limited experience and knowledge, which was a more elementary start point than initially anticipated by the lead researcher.

Given this limited starting point, the teachers had to rely on the researcher as an expert, to direct their learning and make decisions that guided the PD to best address the teachers' needs. Consequently, the researcher made the decisions to focus the PD on building the teachers' knowledge and understanding of GCA using the benchmark elements as a framework for their learning. Despite the researcher's intentions to collaboratively identify the teachers' needs

when designing their GCA unit and lesson plans, the teachers' limited exposure to GCAs and preliminary knowledge and understanding of games-based pedagogy impacted on their capacity to identify what they needed to support them. The researcher comments, "they did not know what they did not know" (Researcher reflection, 30th April 2014). Sarah supported this explaining, "yeah I know what you're thinking, 'what do I need from you', but I don't know what to say" (Sarah, Teacher interview, 1st May 2014).

Similarly, Jenna states, "we can't see what we need" (Jenna, Teacher interview, 1st May 2014). Encouraged to self-reflect on her abilities as part of the PD process, Sarah notes, "…well I think just the main barriers were not having taught it [GCAs] before" (Sarah, Teacher interview, 1st May 2014), suggesting that the limited experiences inhibited her in "coming up with new ideas or, appropriate ideas from something that was irrelevant and making it relevant" (Sarah, Teacher interview, 1st May 2014), causing her to become a little overwhelmed by the PD process. The teachers were poorly prepared within the area of GCAs, which required an unexpected change and further personalisation to the PD process.

The PD process had to be led by the researcher, where she made some decisions to best meet the needs of each teacher. In one teacher interview, she commented, "To me what I'm hearing is that you need more understanding of games" (Teacher Interview, 1 May 2014). Similarly, in one of her reflections, the researcher expressed concerns regarding the teachers' knowledge of GCAs and games, commenting,

> One of the main things that is evident to me is that neither Sarah nor Jenna have knowledge of games centred approaches. I am also concerned with their actual knowledge of the games they are teaching and their strategic and tactical awareness. They really have no idea what I am expecting of them in order to implement GCAs. (Research reflection journal, 1 May 2014)

With such limited knowledge and understanding of GCAs, the concern was how the PD would balance the teachers' individual needs while building their capacity to implement GCAs authentically. The teachers were starting from a more elementary point than expected, with a range of different individual needs to be met by the PD. Thus, from this early stage in the PD process, it appeared that the requirements of the PD, and perhaps the demands to implement all benchmark elements, was much different than initially anticipated.

The literature suggests that the implementation of constructivist approaches such as GCAs requires higher technical and tactical knowledge of games and sport and that many teachers did not have it (Griffin et al., 1997; McNeill, Fry, Wright, Tan & Rossi, 2008). Kirk (2005) warned that GCAs are more demanding of teachers' pedagogical content knowledge and subject matter knowledge than traditional approaches to teaching. Other research has also identified the problems associated with insufficient levels of pedagogical content knowledge when implementing TGfU and reports similar pedagogical difficulties surrounding questioning and the communication involved in GCA lessons as a result of limited pedagogical content knowledge (McNeill et al., 2008; Roberts, 2011; Rovegno, 1998).

Given the increased demand placed on teachers' pedagogical content knowledge when implementing games-based pedagogy and the teachers' limited starting point, it appeared that the PD would have to be complex, to support the individual teachers in developing their knowledge and understanding of all aspects of GCAs. Considering the timespan for the PD, the complexity of the PD appeared to be an overwhelming task for both the teachers and the researcher. In order to make the task more manageable, the researcher used the observational benchmark tool to identify the specific elements of GCA that needed to become the focus of learning in the PD process, to scaffold the teachers learning. Consequently, Metzler's benchmark elements became a framework guiding the teachers' learning, to build their capacity to plan and implement GCAs.

Teaching and Learning Culture

The findings surrounding the teaching and learning culture within the faculty, specifically the teachers existing practice, exposed the teachers' beliefs and assumptions about teaching and learning in PE. These beliefs about teaching and learning in PE, particularly regarding how best to achieve outcomes in PE and how best to teach games appeared to impact on the teachers' attitude towards GCAs and the PD process. The teachers' current practice was grounded in more traditional pedagogy, with a focus on movement skill taught through isolated practice or full-sized versions of the game. The teachers' established pedagogical beliefs about how best to teach games appeared to be in juxtaposition with that of GCA philosophy. As such, participating in the PD caused conflict and division within the faculty, as the researcher tried to address these beliefs as part of the PD process and support the teachers in implementing GCAs.

Existing Practice

Traditional pedagogy

Given the teachers' proclaimed limited exposure to GCAs, it was unsurprising that the teachers' presiding pedagogical practice was aligned with a more traditional method of teaching. Observation of the teachers' lessons before the PD initiative and analysis of the teachers' initial interviews revealed that their current instructional practice was focused on skill development through skill-based isolated practice and full-sized games. The teachers' lessons mostly focused on developing movement skills in isolated activities or drills and then attempting to apply these movement skills in a whole-class game situation that usually, if not always, was the sport itself. Barry explains:

> Fred and I are pretty much going to do Touch Football. We will have lines and run through the backline, make sure they can catch and pass, catching and passing, you know and then we will go into games. Then in the games, we probably won't interact with the kids too much. We will just referee or watch.
>
> (Barry, Teacher Interview 20 March 2014)

The dominance of invasion games

Invasion games dominated the PE curriculum within this school, with little focus and time allocated for other activities or game categories. Other than one Cross-country lessons and one lesson on Athletics, the only other lessons observed by the researcher were invasion games, as illustrated in the researcher's reflections. For example, "There is a clear focus on invasion games within their PE program. Sarah admits she has little knowledge of any other games' areas" (Research reflection Journal, 28 March 2014).

Research suggests, 65 per cent or more of the time spent in Physical Education is allotted to games (Werner, Thorpe & Bunker, 1996, p.28) and undue weight is given to territorial or invasion games (Butler, 1993, Jackson, Jones & Williamson, 1983). While these claims of bias towards games teaching (i.e. invasion) are dated, the ideas are evident within this setting. Similarly, Metzler (2011) stated, "The single content area in most PE programs is the teaching and learning of sport-related games. Other movement forms are constantly introduced into Physical Education, but it is safe to say that traditional games content still remains the biggest part of most school's curriculum" (p.355). Thus, it is quite typical to have

a dominance of invasion games within a PE curriculum. However, the literature shows that these invasion game units of work require a deeper knowledge and understanding of games due to their complex and tactical nature, since invasion games have the characteristic of being the most strategically complex (Turner, Allison & Pissanos, 2006) and because Invasion games occur in more complex settings requiring greater information processing (McMorris, 1998).

Despite the complex nature of invasion games, the existing dominance of invasion games in the teachers' current practice guided the choice of units to be designed in the planning phase, with Jenna choosing Netball, Sara with Soccer and Fred choosing Touch Football. These activities were selected since they represented the teachers' activity preference and the most common content knowledge and expertise for the group. It was hoped that by focusing on activities the teachers were familiar with and had a sound content knowledge within, it could allow for a more focused intent on the pedagogy when teaching the units.

Team teaching

Lessons were typically blocked together, so the teachers could 'team teach' the lesson, "It's usually all team teaching" (Sarah, Teacher Interview, 20th March 2014). This mostly entailed one teacher taking the lead delivering the lesson and the others taking a supervisory role with classes engaged in full size versions of the activity, in one class versus the other scenario. Sarah notes, "The team-teaching lessons turn in to 'here's a game, we're going to split you up into 8 teams, and you're going to do a round robin' that's what they turn in to (Sarah, Teacher Interview, 28th March 2014).

Sarah identified that this team-teaching approach was not necessarily successful, particularly with students in Year 8, she claims "with the Year 9, if one of us is standing up there, they're all paying attention, with those year eights it's a completely different story. Um, and I guess we would normally split them up [teach their individual class]" (Sarah, Teacher interview, 20 March 2014). Davis (1995) suggests team teaching involves "all arrangements that include two or more faculty in some level of collaboration in the planning and delivery of a course" (P. 8), along with the sharing of teaching expertise and reflective dialogue (Chang & Lee, 2010; Jang, 2008). However, in this case, it did not always reflect such collaboration. Lesson observations revealed one teacher leading the lesson and the other taking a more subordinate

role, sometimes stepping into control class behaviour and sometimes even leaving the lesson to attend to other matters.

It appeared that team teaching was often an opportunity to shirk responsibility for teaching and learning within the faculty, particularly with no Head Teacher holding the teachers accountable for their practice. In one interview Sarah comments on why she thinks they use team teaching, commenting, "Probably, because also, the team teaching lessons turn in to "here's a game, we're going to split you up into 8 teams, and you're going to do a round robin" that's what they turn in to. Because he gets to sit and chat and not do anything" (Sarah, Teacher Interview, 28th March 2014). In another interview, Sarah comments, "this isn't a proper faculty, everybody does their own thing" (Sarah, Teacher Interview, 16th May 2014) and "he [Barry] likes not having a head teacher because he can then say, 'But we don't have a head teacher so no one told us that'" (Sarah, Teacher Interview, 16th May 2014). The findings here may indicate a lack of guidance and possibly a lack of teaching philosophy within the faculty as a result of no Head Teacher.

The identified issues of a team teaching approach (both observed and identified by the teachers) were taken into consideration when implementing the chosen unit. It was decided that the teachers would separately teach their own Year eight classes and not use a team-teaching model. Furthermore, the teachers believed that the Year eight students would better respond to GCA lessons, hopefully avoiding potential behaviour issues and class management issues (e.g. allowing teachers to focus on their pedagogy).

Full-sided games

Analysis of the teacher interviews during the unit planning stage demonstrated the teachers' presiding focus on more traditional methods of teaching with their lesson planning designed on implementing full-sided games, as opposed to the small-sided, modified games typical of games-based pedagogy, Sarah comments,

> I feel like, I know we're talking about categories rather than sports but, isn't the purposes of doing a full game teaching them specifically about a game within a category as well? So, they're learning about it generally, but with specific context to?
>
> (Sarah, Teacher interview, 1 May 2014)

And

Sarah: they've had all these focuses of different tactical problems, so hopefully they can put it into practice in a full game.

Researcher: Yep… do you think we need to play a full game?

Sarah: … yeah, I think it's nice to have that

Researcher: I notice that's what you had for your last one was a tournament…

Jenna: is that not part of the game centred approach?

(Teacher interview, 1 May 2014)

These findings further demonstrate the teachers' beliefs regarding the purpose of PE, that is, the multi-activity approach that requires students to have an experience in the 'real' version of the sport for their learning to be meaningful. The teachers believed that the 'real sport' or 'full-sided games' needed to be played, so that their lessons connected with the actual sport. The teachers were still focused on providing experiences that were grounded in a more traditional model of PE and their learning about GCAs and what they looked like in practice needed further support. As such, not only did the PD have to build the teachers' capacity to implement GCAs, it had to challenge the teachers' current beliefs about teaching and learning when teaching games.

Researcher: Ok and it's harder than the way you would usually teach because of what?

Sarah: Because of the focus of the lesson.

Researcher: So, what makes it harder for you?

Sarah: Um changing my thought process.

(Teacher interview, 16 May 2014)

Similarly, Butler (1996) shows how Games-based pedagogy such as TGfU is used with teachers to challenge established practices and beliefs. The teachers were still focused on providing experiences that were grounded in a more traditional model of PE and their learning about GCAs and what they looked like in practice needed further support.

Teacher beliefs about learning in PE

It is possible that the teachers' presiding focus on skill-based practice can be attributed to the teachers established beliefs about how best to improve performance and how best to achieve outcomes in PE. For example, Barry and Fred attributed their focus on skill-based practice to the students' low psychomotor ability, believing the best way to improve their skill execution was through isolated practice and skill drills. Barry comments,

> we have a lot of kids that do not have those basic skills anyway" and "They are like very basic compared to another high school around, you know, we have got kids that… We have kids in year 7 that can't catch and can't throw. (Barry, Teacher interview, 20 March 2014)

Whilst Fred suggested, "Yeah so we have to go back to basics, stage 2 and 3 type skills" (Fred, Teacher interview, 20 March 2014). Barry's assessment of student ability was based in a more traditional context with a focus on skill execution and possibly reflecting his limited content knowledge of games.

Similarly, Fred commented, "I find if you are using a different type of game like touch football into gridiron [modified game], some of the kids we have here won't even have the basic skills like touch football skills" (Teacher interview, 20 March 2014). This suggests that Fred believes that students need to be taught the psychomotor skill of catching before playing a game and that developing the skill of catching will better allow the students to move into playing games. Fred views games as an opportunity to execute skills, again, possibly highlighting his limited knowledge and understanding of GCAs and games.

Barry and Fred believed that the main aim of PE was to develop movement skills, and they struggled to see how GCAs could be used to teach these skills. They perceived their students' current psychomotor skill level to be poor and believed that the only way to improve this was through direct instruction with a technical focus. Barry explains, "… we have to prioritise [what and how we teach in PE] and look at our clientele [students] and think well, it would be nice if they could catch before they leave year 10" (Barry, Teacher Interview 2, 28 March 2014). Barry and Fred appeared to have firmly established beliefs about why and how PE should be taught, and these were firmly rooted in more traditional pedagogy. Given Barry and Fred's later withdrawal from the PD (described later in this chapter), it is possible that

the proposed pedagogy of GCAs was too conflicting to their beliefs about teaching and learning in PE.

Moreover, Jenna perceived the students' ability to be a barrier to implementing GCAs, suggesting that the students didn't have enough knowledge and understanding of games to engage with GCAs. She noted "…the kids although they play soccer, there is a handful who understand the nature of the game and what you need to do and the rest of them are just bodies on the field" (Teacher interview, 20 March 2014), whilst Sarah acknowledged, "Yeah, they just move and follow the ball" (Teacher interview, 20 March 2014). The teachers were looking for the students' physical engagement in the game or their skill execution, using their lack of involvement as an assessment of their games understanding. Jenna was concerned about the students' capacity to learn using GCAs, suggesting that the students may need "a lesson in all the terminology which only a handful of them might have of what it is we are trying to do" (Teacher interview, 28 March 2014). These findings illustrate the teachers' focus on the basic elements (e.g. psychomotor skills and general game play rules) as a critical factor in developing the physically educated student.

Implications for the PD process

The teachers appeared to view teaching and learning in PE through a lens which was firmly centred in a skill-based philosophy. Observation of play, assessment of student ability and beliefs about developing students' capacity to play was viewed through this lens, which was mainly the case for Barry and Fred. These beliefs about teaching and learning in PE are diverse when compare to that of GCA pedagogy. As such, there appeared to be little coherence between the "extent to which teacher learning is consistent with teachers' knowledge and beliefs" (Desimone, 2009, P.184). In considering the later conflict and division caused as a result of the Jenna and Sarah's continued participation in the PD process; it is possible that the teachers presiding beliefs about teaching and learning, framed in a movement skill domain, presented a barrier for the PD and the implementation of GCAs. As a result of these findings, the PD was focused on addressing the teachers' current beliefs about teaching and learning in PE to facilitate change to their teaching practice and support them in their implementation of GCAs.

Teacher attitude towards Game Centred Approaches and PD

Analysis of the teacher interviews, particularly following the researcher's demonstration of GCA lessons, exposed the teachers' attitudes towards GCAs and the PD process. These attitudes appeared to be significant in setting the teaching and learning culture within the faculty and impacted on the teachers' response to GCAs and the PD process. Initially, all the teachers appeared optimistic towards GCAs and the PD process, commenting "I know it is going to be great, I know it will be good" (Fred, teacher interview, 28th March 2014). The teachers identified a range of the valued outcomes for the students as a result of being taught using games-based pedagogy. These included cognitive and affective benefits and increased engagement and participation. These perceived valued outcomes associated with GCAs initially appeared to advocate the use of games-based pedagogy and facilitate their engagement in the PD process, particularly for Sarah and Jenna. However, as the PD progresses, a clear difference in attitude between Jenna and Sarah, the two teachers that remained part of the study, and Fred and Barry who withdrew from the study were observed. Sarah and Jenna's continued participation in the PD process and perseverance with games-based pedagogy caused animosity and a divide within the faculty, baring implications for the PD process.

Valued outcomes for the students

Following the researcher's GCA demonstration presentation and lessons, the teachers identified a range of valued outcomes for their students as a result of being taught using games-based pedagogy. These perceived benefits of GCAs identified by the teachers are consistent with those identified in the GCA literature, including the potential to develop cognitive and affective skills or skills beyond the psychomotor domain; and increased participation and engagement for students of all abilities (see: Butler, 1997; Evans & Light, 2008; Gréhaigne, Godbout & Bouthier, 1999; Mandigo et al., 2008; Mitchell, Oslin & Griffin 1995; Pearson, Webb, McKeen, 2005; Rovegno, Nevett & Babiarz, 2000; Wright, McNeill, & Fry, 2009).

Sarah, in particular, showed enthusiasm for GCAs and the PD process, suggesting it offered the students 'something new' and 'A new way for them to participate in a lesson' (Sarah, Teacher Interview, 28 March, 2014), presenting a variation to their usual teaching practice by 'putting more variety into the lessons' (Sarah, Teacher Interview, 28 March, 2014). Similarly, following her observation of the requested demonstration lessons. Sarah commented,

> I thought that it was – yeah like it was good it was really interesting to watch and to see the different categories of games and how they get incorporated, you know, in this style. I guess those sorts of activities I would do, but I would do it as a once-off, not as a unit and through – as we keep talking about progression and the progression of activities.
>
> (Sarah, Teacher interview, 11 April 2014)

In a later interview, Sarah maintained this positive attitude towards both the GCAs, seeing the PD as an opportunity to widen her skills set as a teacher and not fit the status quo within the faculty, she comments on the PD opportunity, "just widening my skills so that not every lesson is exactly the same maybe and not letting it become mundane which I guess it could in the future looking at other people [referring to Barry]" (Sarah, Teacher interview, 16 May, 2014). Fred identified GCAs as another approach to provide more variation in teaching styles, commenting "I think GCAs and stuff like that just adds to what you can use… it adds more strings to your bow in teaching" (Fred, Teacher Interview, 28 March 2014). There was a level of interest in GCAs, yet the end goal was diverse with one teacher identifying that student skill could be enhanced while another was focused on experiences.

Cognitive and affective benefits

Sarah and Jenna identified specific cognitive and affective benefits associated with GCAs. In the needs-assessment phase, Jenna and Sarah identified that the students were encouraged to "start to think for themselves" (Jenna, Teacher Interview, 28 March 2014) and that students were "thinking more about how to play these games instead of just going 'give me the ball, I want the ball, let's play this game'" (Sarah, Teacher interview 11 April 2014). Sarah was pleasantly surprised by how much the students already knew about games, it appeared that the game-based pedagogy highlighted the students' current knowledge and understanding or perhaps provided an opportunity for the teachers to see what they knew:

> They're, I guess, understanding better, the reasons behind the game or the reasons why things work, and why things don't. Whereas before they would have never ever thought about it… but they know it all. You know, they do know all the information they just haven't put it and gone "this goes with this and that makes sense now to me.
>
> (Sarah, Teacher interview, 11 April 2014)

The teachers commented on the potential of GCAs to develop skills beyond the physical domain, such as "tactics and spatial awareness and stuff that is above and beyond, sort of just catching and kicking and passing and throwing" (Barry, Teacher Interview, 28 March, 2014). They also identified the capacity game-based pedagogy has to "promotes more about anticipation… Where to go and why" (Jenna, Teacher Interview, 28 March 2014) and "Teamwork, I guess for invasion games, as invasion games seem to be more team-based games" (Sarah, Teacher Interview, 28 March 2014).

Similarly, in the implementation phase, both Sarah and Jenna observed that implementing games-based pedagogy allowed the students to better develop and demonstrate their knowledge and understanding within games. Jenna highlights how GCA lessons allow students to demonstrate their knowledge and understanding despite maybe not having the technical ability to execute the skill in practice. She also notes how game-based pedagogy may expose the seemingly technically talented students for their limited knowledge and understanding, she comments,

> they have more knowledge than what we give them credit for a lot of the time and even if they don't have great execution skills some of them still know what they need to do. They just can't do it, and some are the other way around. They can pass a ball quite reasonably, but really have little idea of where and how to move and how to support, how to defend.
>
> (Jenna, Teacher interview, 18 June 2014)

Both Sarah and Jenna noted how game-based pedagogy promoted active learning, empowering the students "By discovering it for themselves" (Sarah, Teacher interview, 18 June 2014) and "rather than just, you know having kids in these tedious lines and: 'You will do this' they are learning on the go" (Jenna, Teacher interview, 18 June 2014). Both teachers advocate how GCAs fosters learning within the cognitive domain, both teachers note,

> We were talking about how you see some kids might not know how to effectively do something but then when you talk about it, they have got the knowledge, they know why they are doing it – they might not be able to execute it perfectly, but they have got the idea and understand the reasoning (Sarah, Teacher interview, 20 June 2014).

And

> I guess maybe looking more deeply at what the kids are doing even if you do not verbally give them feedback right then and there, they have a better understanding of how they are going as well.
>
> (Jenna, Teacher interview, 20 June 2014).

Interestingly, it was mainly Sarah and Jenna that observed these cognitive and affective benefits of GCAs. Neither Barry nor Fred commented on these valued outcomes for their students. The findings perhaps reveal what the teachers value in PE and what they see as the purpose of PE lessons.

Engagement and participation

Sarah, Jenna and Fred also perceived GCAs to promote increased participation and engagement in lessons for all students. In the needs-assessment phase, Sarah perceived that implementing games-based pedagogy may promote "higher participation within the lesson, so not as many kids standing around, waiting for their turn" (Sarah, Teacher Interview, 28 March, 2014) and 'more involvement, like throughout the lesson' (Sarah, Teacher Interview, 28 March, 2014). Whilst Fred commented on 'getting max numbers participating' (Fred, Teacher Interview, 28 March 2014), and Jenna noted having the students 'more engaged' and 'more practice' (Jenna Teacher Interview, 28 March 2014).

Later in the implementation (Phase C) and evaluation phases (Phase D), reflecting on their implementation of GCAs, Sarah and Jenna both observed that GCAs had the potential to cater for a range of different student abilities, highlighting this as a particular benefit of implementing games-based pedagogy. Jenna notes how her GCA lessons allowed students that were less physically able to be more involved in her lesson, noting,

> I have been seeing benefits in terms of the kids that are less skilful because they are playing with people of the same ability and if they are doing 3 on 3, they are getting more actively involved and are enjoying it so much more than before. (Jenna, Teacher interview, 20 June 2014)

Likewise, Sarah observed that she was better able to engage students that would usually be excused from PE due to being sick or injured, "Definitely the people who were not able to participate for sickness, injury, illness – whatever – were more involved in those handful of

lessons than what they have ever been. They were actively doing stuff all the time" (Sarah, Teacher interview, 20 June 2014).

Similarly, reflecting on their practice Sarah and Jenna observed that GCAs allowed students of all abilities to be 'actively involved' in the lesson and that the games-based pedagogy promoted more enjoyment in their lessons, Jenna notes "they [the students] are getting more actively involved and are enjoying it so much more than before" (Jenna, Teacher interview, 20 June 2014). Sarah also noted the potential GCA lessons had to extend more technically able students by engaging them in the cognitive domain, noting "They are getting to be against kids that are of the same ability, so you are still challenging them, and you are getting them to think about it too" (Sarah, Teacher interview, 20 June 2014). Jenna notes how the game modifications allowed more able students to be extended, "And then you put more limitations on what they are able to do so they need to work harder or think about it differently" (Jenna, Teacher interview, 20 June 2014).

Both Jenna and Sarah believed that using small-sided modified games, allowed the students to feel more confident in their learning environment and less confronted, compared to traditional skill-based lessons where they are exposed for all to see. Jenna comments,

I think small-sided games the kids seem to be less confronted because they feel like everyone is busy and they are not maybe being watched by so many people and they can just do what they are doing instead of when there is five on five and other people are watching and then they are like I do not want to do it because I know I am not as good as that person that is watching me (Jenna, Teacher interview, 20 June 2014).

These findings show how Jenna and Sarah were able to start to challenge their original beliefs about teaching and learning and see the benefits of games-based pedagogy which proved to be facilitating agents in the implementation of GCAs and the perseverance of the PD.

Efficient teaching

Improved 'time management' (Fred, Teacher Interview, 28 March 2014) or more efficient use of lesson time was also perceived to be a benefit of implementing GCAs. Jenna commented that GCA's have the potential to "develop skills equally and efficiently" (Jenna,

Teacher Interview, 28 March 2014) and noted the time and efficiency benefits of focusing on situating the skills within the context of the games as with GCAs. The teachers drew comparisons between using a GCAs and a more traditional approach focusing on using skill drills.

Fred: Well, if you don't just spend half an hour just practicing throwing and catching

Jenna: And doing lots of demonstration and straight into it [a game]

Fred: It is better time management

(Teacher Interview, 28 March 2014).

Moreover, having conducted an informal survey of the student's response to the demonstration GCA lessons, the students appeared to favour being taught using this innovative pedagogy. Sarah comments, "the majority of the group said they'd prefer to do it that way [GCAs] because there's a bit more interaction between the kids" (Sarah, Teacher interview, 11 April 2014). Sarah revealed that the students "liked the interaction they liked that they could, I guess, come up with something themselves and not just being told all the time what to do" (Sarah, Teacher interview 11 April 2014). The students also seemed to respond positively to the innovative pedagogy of GCAs which also appeared to be a motivating agent for the teachers to engage in the PD process and implement GCAs, particularly for Sarah. Both Bechtel and O'Sullivan (2007) and Cothran (2001) highlight the power of students in their study of successful curricular change. Bechtel and O'Sullivan (2007) found student support to be key to the teacher change process.

Even though the findings here identify a range of valued outcomes for students when implementing GCA, it is possible that these findings also indicate the failings of the teachers' existing pedagogical approach to highlight the students cognitive and affective learning when teaching games. This may be an area gone unrecognised as a result of the skill-based focus of the teachers' current pedagogy. As such, the findings here may be associated with the teachers' previous held beliefs and assumptions about the purpose of PE which appeared to impact on their selection of pedagogical approach to teaching games, as well as the teachers' attitude towards PD.

It appeared that observing the GCA in practice (e.g. researcher-led example lessons) allowed the teachers to see the learning potential associated with games-based pedagogy, making the

PD process more relevant and applicable to them and demonstrating greater coherence. The teachers were able to observe the capacity of GCAs to promote and improve a range of learning outcomes for their students, and they appeared to be motivated by this prospect. The findings here seem to support the element of coherence being fundamental in the PD process whereby the innovated pedagogy proposed as part of the PD needs to be consistent with the aspired learning goals of the teachers. Moreover, these findings are in line with the model of teacher change presented by Guskey (2002) whereby teachers need to gain evidence of improvements in student learning from their change in classroom practice, in order to promote change in their attitudes and beliefs.

Concerns about GCA PD

Consistent with concerns echoed in the PD literature (see: Armour and Yelling, 2007; Butler, Lauscher, Jarvis-Selinger & Beckingham, 2004; Garet, Porter, Desimone, Birman, & Suk Yoon, 2001; Knight, 2002), both Barry and Fred raised concerns regarding the capacity of PD programs to facilitate and sustain change to teaching practice. They identified the potential of reverting to original practice when returning to school. Barry commented, "When it gets difficult, you just revert to what you know, as soon as you have the kids go 'ah no we are not doing that" (Teacher interview, 20 March 2014).

Similarly, Fred supported this stating,

> You go back to your comfort zone. That is, a lot of Professional Development is all good in theory, up on the white board and on the smartboard, and you go, oh yeah that is really, really great but then to come back and change all your programs, that you have spent years writing, you do revert back to what you know. I have always said that you come out of professional development and you go, well how is that going to change my teaching, and well, it hasn't.
>
> (Fred, Teacher interview, 20 March 2014)

Jenna's concern was focused on her reliance on skill-based practice, noting her concern about reverting to a focus on movement skills. She comments, "Jenna: if I'm missing the context of the game, it might be overridden by skills which defeats the purpose of what we're doing (Jenna, Teacher interview, 1 May 2014). Interestingly, Sarah's concerns were surrounding her colleagues' capacity to collaboratively plan the GCA unit and lesson plans, suggesting

that they [Fred and Barry] needed to 'be more organised' (Sam, Teacher interview, 28 March 2014). There appeared to be a limited commitment to this organisation. Similarly, Barry had concerns surrounding the time demands of such a collaborative practice, hoping it would become more 'streamlined' and take less time (Barry, Teacher interview, 28th March 2014) once the teachers and the students became more familiar with GCAs.

Resistance to change

Sarah and Jenna perceived Barry and Fred to be resistant to change, identifying this as an overriding barrier to the direction and progress of the PD. Sarah, in particular, perceived both Barry and Fred to be "pretty set in their ways" (Sarah, Teacher interview 16 May 2014) and have quite a negative attitude towards the GCA PD. Sarah perceived Barry, in particular, to be resistant to change, identifying the influence he held over the other faculty members. She notes, "I think also it's the negative over here [pointing to Barry's desk], he influences everyone because if he doesn't like it, it doesn't happen... how this staff room functions is that if he's on board it happens (Sarah, Teacher interview, 16th May). Sarah believed that engaging in the PD process, especially the planning that was involved, was too much work and too much effort for Barry and Fred. She noted, "I think he [Fred] thinks it's a lot of work" and "Well that's what the two of them [Barry and Fred] have been mentioning… doing lesson plans is a lot of work" (Sarah, Teacher interview, 1 May 2014) and "I think it's just the effort, honestly, like the effort to do this [planning lessons as part of the PD process]" (Sarah, Teacher interview, 16 May, 2014). Sarah believed that because Barry and Fred were experienced teachers, they felt they didn't need to plan their lessons, noting "basically when you've been teaching the same stuff for 15 plus years, why do they need to [plan lessons]" (Sarah, Teacher interview, 1 May 2014).

In contrast, both Sarah and Jenna appeared quite open to change, demonstrating willingness to be involved in the PD process. Sarah in particular was motivated to engage in the PD process, noting, "I guess I'm more interested in improving my pedagogical skills where the others think that they are good as they are and don't feel the need to seek improvement" (Sarah, Teacher interview, 16 May 2014). Sarah was the driving force behind the PD process, commenting, "I guess I took charge and pushed for this [engaging in the PD]" and "I guess, I'm making it [the PD] more of a priority".

Jenna was confronted with a dilemma concerning her presiding beliefs about teaching and learning and that proposed by the games-based pedagogy. Nevertheless, despite Jenna's established beliefs about teaching and learning in PE, with her philosophy grounded in skills-based practice, she persevered with the PD process. The following conversation illustrates Jenna's dilemma:

> Jenna: yeah, I've got a good understanding of skills, but it's not skills that I need to have an understanding of. It's…
>
> Researcher: but we can still focus on skills, Jenna, it's not a problem to focus on them as long as we're doing it within the context of the game. So, you know,
>
> Jenna: if I'm missing the context of the game, it might be overridden by skills which defeats the purpose of what we're doing
>
> (Teacher interview, 1 May 2014)

The PD challenged Jenna's beliefs about teaching and learning in PE. However, she overcame the resistance to change and persevered with the PD process and facilitated change to her teaching practice.

These findings show Barry and Fred's lack of willingness to collaborate and engage in the PD process, and the limited accountability for this is consistent with other PD research around education reform and facilitating change (Zimmerman, 2006). Considering Barry and Fred's later withdrawal from the study, perhaps these early attitudes reveal a lack of tenacity and commitment to initiate and sustain change to their teaching practice. Moreover, these findings possibly highlight issues with coherence, showing that perhaps the model of PD and the GCA pedagogy proposed was not in line with Barry and Fred's goals and learning needs or perhaps their beliefs about teaching and learning. As Butler (2005) argues, 'the rub is that change is not always comfortable' (p. 228) specifically referring to the generation of teachers who 'teach the way they were taught' (p. 226). These issues with coherence and resistance to change were particularly apparent with Barry and Fred during the planning phase with the increased demands for the teachers to plan a unit of work and subsequent lesson plans. The findings here suggest that teacher attitude may impact on the success of a PD program in supporting change to teaching practice. These findings reinforce the importance of the needs-assessment phase within the PD model, providing early insight into teacher attitude and

dispositions, that may reveal their suitability to initiate and sustain change to their teaching practice.

Breakdown of collegial relationships

As the PD progressed, fractures began to appear within the faculty, with a breakdown in collegiately between the PLC members. The difference in attitudes between Sarah and Jenna and Barry and Fred appeared to negatively impact the collegial relationships within the faculty, implicating the PD process. Towards the end of the PD process, Sarah and Jenna revealed the conflict and animosity caused within the faculty. This conflict appeared to be in response the Sarah and Jenna's continued participation in the PD. There appeared to be a real dilemma regarding the learning culture within the faculty. Both Sarah and Jenna disclosed the nature of discussions between them and Fred and Barry when discussing GCAs and the PD process. The noted, "Heated arguments, yes agree to disagree and moving on and it was like this conversation now must end before somebody hurts somebody" (Sarah, Teacher interview, 20th June 2014) and "Pretty heated over lunchtime, raised voices, but what about [traditional pedagogy] this is what I know, this is what I have taught" (Jenna, Teacher interview, 20th June 2014).

Sarah described the impact of her and Jenna's sustained participation in the PD process on the faculty as "Divided. Divided interest. Divided support. Reluctance to change long-term practices" (Sarah, Teacher interview, 20th June 2014). Jenna corroborated this by adding "Not only just to change but to see the benefit [of using game-based pedagogy]. I think that has been a thing where I have been trying to explain that and he [Fred] keeps going we will agree to disagree – he just does not want to understand" (Jenna, Teacher interview, 20 June 2014). Both Jenna and Sarah were disappointed with the lack of involvement and collaboration from Barry and Fred, mainly since Jenna and Sarah were able to reflect on their practice and see the benefits of the PD process and implementing GCAs with their students.

Both Sarah and Jenna felt unsupported in their efforts to facilitate change to their teaching practice by Barry, Fred and Senior Management at the school. They did not feel the implementation of GCAs was advocated, facilitated or supported within the PDHPE faculty. Jenna comments, "there will be no facilitating change here" (Jenna, Teacher Interview, 18 June 2014) and "She [The Principal] seemed supportive of the process right at the beginning,

but once the process started, we haven't seen her or heard her" (Jenna, Teacher Interview, 18 June 2014). The following extract also notes how Jenna and Sarah felt unsupported,

Researcher: Do you think the implementation of a game centred approach was advocated here, facilitated and supported?

Jenna: As a whole school, or as a whole faculty?

Researcher: Think in terms of you two, as a faculty and as a whole school.

Sarah: As a faculty, no. From Senior Management, no.

Jenna: No

(Teacher interview, 18 June 2014).

It appeared that, despite the attempted personalised nature of the PD being tailored to the teachers' individual needs, there was a minimal culture for change within the school or faculty. As the teachers engaged in the PD process, the value of the PD started to diminish. There was no driving philosophy across the school or within the department, nor was there a mechanism for accountability. Therefore, the structure of the PD struggled to impact the teachers' practice and the learning culture within the faculty, particularly when dilemma such as accountability and support or value for PD were not evident. These findings raise some critical questions regarding the culture for learning within the faculty and how PD tackles cultural dilemmas such as resistance to change, as presented here. Consideration needs to be given to how these cultural dilemmas will be resolved and overcome when implementing a model of PD.

Teacher capacity to implement Game Centred Approaches

The observational benchmark tool designed using Metzler's (2011) 'tactical games teacher benchmark' elements was used as a fidelity checklist to measure the faithful implementation and quality and quantity of implementation of GCAs. This benchmarking tool provided a lens through which to make a judgement about the teachers' capacity to implement GCAs and a means to determine the impact of the PD process. Analysis using the benchmark tool was conducted on the teachers' unit overview and individual lessons plans in the planning phase and through observation of each of the teachers' lessons delivered in the implementation phase. Each of the benchmark elements was recorded according to whether they were present, present to a lesser degree or absent. A compliance measure was calculated for the unit overview, each of the lesson plans and their subsequent delivery. The compliance measure allowed the teachers' implementation of GCAs to be compared across each PD

phase and inference to be drawn regarding the teachers' capacity to implement GCAs across the PD process. The findings using the benchmark tool are corroborated with analysis of the teacher interviews and researcher observations.

Initial capacity to implement GCAs

Initial analysis of the teachers' unit overview using the benchmark tool revealed two of the eight benchmark elements to be present. Unit analysis included elements 1. Creating a tactical problem as the organising centre for learning tasks and 2. Teacher begins unit segment with a game form to assess student knowledge. There was no evidence of the remaining six elements included in the unit overview (see Appendix 20), demonstrating only 25% compliance with the GCA (see Table 9).

Table 9. *Teacher Benchmarks: Unit Overview - Observational Benchmark tool analysis*

Benchmark Element	Unit Plan	% Compliance
1. Creating a tactical problem as the organising centre for learning tasks*	✓	100%
2. Teacher begins unit segment with a game form to assess student knowledge*	✓	100%
3. Teacher identifies needed tactical and skill areas from game form,	X	0%
4. Teacher uses deductive questions to get students to solve the tactical problem*	X	0%
5. Teacher uses clear communications for situated learning tasks,	X	0%
6. Teacher uses high rates of guides and feedback during situated learning tasks*	X	0%
7. Teacher provides a review that includes the tactical problems of the lesson.	X	0%
8. Assessment.	X	0%
Compliance to all benchmark elements	2 of the 8 elements	25%

* Non-negotiable elements (as espoused by Gurvitch, Blankenship, Metzler & Lund, 2008, Harvey et al., 2016 & Harvey & Robertson, 2017).

The expectation, as guided by other GCA research (See: Gurvitch, Blankenship, Metzler & Lund, 2008, Harvey et al., 2016 & Harvey & Robertson, 2017) was that four of the eight benchmark elements (50% compliance) would be met to demonstrate competency, with the

four key ‘non-negotiable’ teacher benchmarks including 1. teacher uses tactical problems as the organising centre for the learning tasks, 2. teacher begins each lesson with a game form to assess students’ knowledge, 3. teacher uses deductive questions to get students to solve tactical problems, 4. teacher uses high rates of guides and feedback during situated learning tasks. Only two of the ‘non-negotiable’ teacher benchmarks were demonstrated, showing limited fidelity to the GCA model. These findings suggest that the teachers’ initial capacity to implement GCAs effectively was limited, unsurprising given the teachers starting place with limited exposure to games-based pedagogy and superficial knowledge and understanding associated with GCAs. Since Sarah had taken a lead role in the collaborative planning of the unit overview, these findings are possibly more accurately representative of Sarah’s capacity in this planning phase over Jenna’s.

Despite the observational benchmark tool showing evidence of the tactical games’ elements in the unit overview, analysis of the teacher interviews showed Jenna and Sarah’s uncertainty and difficulties around designing teaching and learning activities to highlight a tactical problem. For example, Sarah noted, “Yeah, like for instance, the lesson on using space, that was the hardest one, I guess. Like, we were sitting thinking how on earth were we going to teach them about using space or taking in turns to break for the ball and all that” (Sarah, Teacher interview, 1 May 2014). Furthermore, in a later interview stating, “I guess coming up with the lessons and figuring out how to create environments so that they can focus on just one aspect like whether it is maintaining possession or how they use the space which they’ve got, the strategic problem” (Teacher interview, 16th May 2014). Similarly, Jenna struggled to see how games could be designed around a tactical concept to highlight game-play or skilled performance through the context of a game. She comments,

> Jenna: yeah, I’ve got a good understanding of skills, but it’s not skills that I need to have an understanding of. It’s…
>
> Researcher: But we can still focus on skills, Jenna, it’s not a problem to focus on them as long as we’re doing it within the context of the game. So, you know…
>
> Jenna: if I’m missing the context of the game, it might be overridden by skills which defeats the purpose of what we’re doing
>
> (Teacher interview, 1 May 2014)

These findings further reflect the teachers beginning knowledge and understanding surrounding GCAs which impacted on their capacity to implement GCAs early in the PD process. Given the teachers' starting point and their limited exposure to GCAs, these findings were to be expected. These findings highlight the extensive support the teachers needed to implement GCAs authentically as part of the PD process.

Table 10. *Teacher Benchmarks: Sarah's Lesson Plan and Lesson Delivery - Observational Benchmark tool analysis*

Benchmark Element	Sarah Lesson Plans						Sarah Lesson Delivery				
	1	2	3	4	5	% Compliance	1	3	4	5	% Compliance
1. Creating a tactical problem as the organising centre for learning tasks*	✓	✓	✓	✓	✓	100%	✓	X	X	✓	50%
2. Teacher begins unit segment with a game form to assess student knowledge*	✓	✓	✓	✓	✓	100%	✓	✓	✓	✓	100%
3. Teacher identifies needed tactical and skill areas from game form	✓	✓	✓	X	✓	80%	-	X	X	✓	38%
4. Teacher uses deductive questions to get students to solve the tactical problem*	✓	✓	✓	X	✓	80%	-	-	X	✓	50%
5. Teacher uses clear communications for situated learning tasks	X	X	X	X	✓	20%	-	-	X	✓	50%
6. Teacher uses high rates of guides and feedback during situated learning tasks*	X	X	X	X	✓	20%	-	-	X	✓	50%
7. Teacher provides a review that includes the tactical problems of the lesson	X	X	X	X	✓	20%	-	-	X	✓	50%
8. Assessment	X	X	X	✓	X	20%	-	-	✓	X	50%
Compliance to all benchmark elements	4/8	4/8	4/8	3/8	7/8	22/40	5/8	3.5/8	2/8	7/8	17.5/32
	50 %	50 %	50 %	38 %	88 %	55%	63%	44%	25%	88%	55%

✓ element present
\- element present but to a lesser degree
x element not present

* Non-negotiable elements
\- No change in capacity from previous phase

< Decrease in capacity from previous phase
> Increase in capacity from previous phase

Table 11. *Teacher Benchmarks: Jenna's Lesson Plan and Lesson Delivery - Observational Benchmark tool analysis*

Benchmark Element	Jenna Lesson Plans							Jenna Lesson Delivery				
	1	2	3	4	5	6	% Compliance	1	3	5	6	% Compliance
1. Creating a tactical problem as the organising centre for learning tasks*	✓	✓	✓	✓	✓	✓	100%	✓	-	x	✓	63%
2. Teacher begins unit segment with a game form to assess student knowledge*	✓	✓	✓	✓	✓	✓	100%	✓	✓	✓	✓	100%
3. Teacher identifies needed tactical and skill areas from game form,	✓	✓	✓	✓	X	✓	83%	-	-	x	✓	50%
4. Teacher uses deductive questions to get students to solve the tactical problem*	✓	✓	✓	✓	X	✓	83%	✓	-	x	✓	63%
5. Teacher uses clear communications for situated learning tasks	X	X	X	X	X	✓	17%	✓	-	✓	✓	88%
6. Teacher uses high rates of guides and feedback during situated learning tasks*	X	X	X	X	X	✓	17%	-	✓	x	✓	63%
7. Teacher provides a review that includes the tactical problems of the lesson	X	X	X	X	X	✓	17%	-	✓	✓	✓	88%
8. Assessment	X	X	X	X	✓	X	17%	-	x	✓	x	38%
Compliance to all benchmark elements	4/8	4/8	4/8	4/8	3/8	7/8	26/48	6/8	5/8	4/8	7/8	22/32
	50 %	50 %	50 %	50 %	38 %	88 %	54%	75%	63%	50%	88%	69%

✓ element present
\- element present but to a lesser degree
x element not present

* Non-negotiable elements
\- No change in capacity from previous phase

< Decrease in capacity from previous phase
> Increase in capacity from previous phase

Table 12. *Compliance measures across the Unit Planning, Lesson planning and Implementation phases*

Benchmark Element	Unit	Sarah				Jenna			
		Lesson Plan		Lesson Delivery		Lesson Plan		Lesson Delivery	
1. Creating a tactical problem as the organising centre for learning tasks,	100%	-	100%	<50%	50%	-	100%	<37%	63%
2. Teacher begins unit segment with a game form to assess student knowledge,	100%	-	100%	-	100%	-	100%	-	100%
3. Teacher identifies needed tactical and skill areas from game form,	0%	> 80%	80%	<42%	38%	>83%	83%	<33%	50%
4. Teacher uses deductive questions to get students to solve the tactical problem,	0%	>80%	80%	<30%	50%	>83%	83%	<20%	63%
5. Teacher uses clear communications for situated learning tasks,	0%	>20%	20%	>30%	50%	>17%	17%	>71%	88%
6. Teacher uses high rates of guides and feedback during situated learning tasks	0%	>20%	20%	>30%	50%	>17%	17%	>46%	63%
7. Teacher provides a review that includes the tactical problems of the lesson.	0%	>20%	20%	>30%	50%	>17%	17%	>71%	88%
8. Assessment.	0%	>20%	20%	>30%	50%	>17%	17%	>21%	38%
Compliance to all benchmark elements	25%	>30%	55%	-	55%	>29%	54%	>15%	69%

< Decrease in capacity from previous phase > Increase in capacity from previous phase

Improved capacity to implement Game Centred Approaches

In contrast, comparing the teachers' compliance measures across the lesson planning and lesson implementation phases demonstrated the teachers improved capacity to address the benchmark elements. Table 10 and Table 11 show Sarah and Jenna's respective lesson plan and lesson delivery analysis using the observational benchmark tool with calculated compliance measure for each element, with a comparison of their compliance scores across the planning and implementation phase shown in Table 12. In the lesson planning phase, all eight benchmark elements were increasingly present in both teachers' lesson plans, demonstrated through the teachers' increased overall compliance score, with more benchmark elements being presented in the teachers' lesson plans compared to their unit overview. Sarah and Jenna's overall compliance score improved from 25% in their unit plan to 55% and 54% (see Table 12) respectively across their lesson plans; demonstrating a 25% and 24% increase in their compliance measures (the 1% difference between them can be accounted for by Jenna teaching one extra lesson than Sarah). These findings show significantly increased fidelity to GCAs when planning GCA lessons.

Significant improvement was observed in elements 3. Teacher identifies needed tactical and skill areas from game form, and 4. Teacher uses deductive questions to get students to solve the tactical problem, with the compliance measure for these elements increasing from 0% in the unity plan to 80% in the lesson plan for Sarah, and 0% to 83% for Jenna. Some improvement was also observed with elements, 5. Teacher uses clear communications for situated learning tasks, 6. Teacher uses high rates of guides and feedback during situated learning tasks, 7. Teacher provides a review that includes the tactical problems of the lesson and 8. Assessment. The compliance scores for these elements improved from 0% to 20% for Sarah and 17% for Jenna. Comparing these compliance measures across the unit planning and the lesson planning phase shows a considerable growth in the teachers' capacity to address these elements when planning their lessons.

These findings show that both Sarah and Jenna were able to consistently demonstrate three of the four non-negotiable elements through their lesson plans, showing they were able to plan lessons with greater faithfulness to GCAs. These findings suggest that the teachers' capacity to implement GCAs had developed from the unit planning phase to the lesson planning phase. As such, it could be suggested that the PD had a positive impact on the teachers'

ability to plan GCA lessons. It appeared that the PD process with the scaffolding strategies applied had a significant impact on the teachers' capacity to plan GCA lessons, with significant improvements to elements 3 and 4. Conversely, these findings also indicate that the teachers still needed further support and scaffolding around elements 5-8. The findings also suggest that some of the previous barriers may still have been in place, impacting on the effective implementation of the GCAs. Regardless, the PD appeared to have supported the teachers in building their capacity to implement GCAs authentically.

Further improvements were observed across the lesson implementation phase, particularly for Jenna. Jenna demonstrated a 15% improvement across her lesson with her overall compliance measure increasing from 54% in the lesson planning phase to 69% in the implementation phase. Although less significant than the 24% gain in compliance from the unit planning to the lesson planning phase, this 15% gain still demonstrates an improvement for Jenna, showing greater fidelity to GCAs and further growth in her capacity to implement GCAs in practice. In contrast, Sarah's overall compliance measure remained the same at 55% for both the planning and implementation phases, suggesting no change in her capacity to implement GCAs between the lesson planning and lesson implementation phases. However, improvements with some elements were observed.

Analysis of each individual benchmark element across the lesson implementation phase showed significant improvements with elements five to eight, the elements less evident in the planning phase. Jenna's compliance measure for elements 5 and 7 dramatically increased 71%, from 17% to 88%, element 5 increased by 46% and elements 8 increased 21%; whilst Sarah's increased 30%, from 20% to 50% for each of the elements 5 to 8. These findings show that the teachers were better able to demonstrate these communication and assessment elements in practice compared to the theoretical application in their lesson plan. It is possible that the practical setting may have allowed these communication elements to be better observed compared to the theoretical nature of the lesson plan. However, the findings still show improvements in the teachers' capacity to implement these elements in practice.

Moreover, in planning and delivering their final lesson, Sarah's lesson five (LP5) and Jenna's lesson six (LP6), both teachers demonstrated seven of the eight benchmark elements in their lesson plan and in practice when delivering their lesson. Analysis of these final lessons showed that the teachers could both plan and deliver lessons demonstrating a much greater

degree of faithfulness, with 88% compliance with GCAs. The only missing element was element 8. Assessment.

These findings show increased fidelity to GCAs across the lesson planning and lesson implementation phases, particularly for Jenna, with both teachers demonstrating an improved capacity to implement GCAs authentically. These findings may infer that the PD had been successful in providing ongoing support for the teachers in order to further develop their capacity to implement GCAs authentically. Analysis of the teacher interviews corroborated these findings across the lesson planning and implementation phases. The teachers, encouraged to reflect on their practice as part of the PD process, were able to self-detect their developing capacity when implementing GCAs. Sarah noted, "I feel like I'm getting better, I was saying to you [Casual teacher] I've been practising my lessons. Like we just did one this morning and I think the lesson went pretty well. I think Paul [Casual teacher] was surprised how smoothly it ran… I thought it went well" and "Yeah like I feel slightly confident to run them [GCA lessons] as I have been, well just been doing it, but I guess it's I've really only done like, I guess, with the strategical questions or problems or whatever" (Sarah, Teacher interview, 16 May, 2014). Following a later lesson, Sarah noted, "I guess I feel like I am learning more about how to teach the concept of the game rather than this is how you play the game" (Teacher interview, 23 May 2014). The PD process had supported Sarah's ability to self-reflect on her teaching practice, along with improving her confidence and capacity to implement GCAs, where she started to detect specific elements of GCA within her practice. This development in Sarah's capacity led her to experiment with games-based pedagogy in other lessons. Sarah noted, "yeah so like we have been trying, so like yesterday we were doing an invasion game strategy, you know games that approach strategy for invasion games, we were using hockey as our sport of choice for something a bit different. And like it went pretty well yesterday for a first lesson" (Sarah, Teacher interview, 1 May 2014).

Similarly, Jenna reflects on her improving confidence and capacity when implementing her lessons, noting "I did enjoy last week's lesson because I could see exactly the teams that were working, that had skills and the teams that did not, and it was just really easy to modify" (Jenna, Teacher interview, 23 May). Moreover, "I did not feel that I needed to refer to the notes as much because I had an understanding of how the question was going to go a little bit more" (Teacher interview, 23 May 2014). These findings suggest that the PD process has

built Jenna's capacity to reflect on her practice and identify what is going on in the games. The teachers were building their capacity and confidence as active learners.

As the PD progressed, the teachers' capacity to implement GCAs developed, with specific success both in planning and delivering their final lesson. These findings suggest that the PD was successful in supporting the teachers learning and developing their capacity to implement GCAs. However, these findings also expose areas where the teachers needed further support to further develop their capacity to implement GCAs. Moreover, it is important to note that these findings are related to one chosen unit of work, where the teachers felt they had proficient content knowledge and confidence. Thus, the teachers would possibly require further and perhaps different support when applying games-based pedagogy to other activities and environments. Although, they would be starting from a different knowledge base compared to this unit.

Translating Game Centres Approach theory to practice

Despite the foregrounding evidence supporting the teachers' improved capacity throughout the lesson planning and implementation phase, the less significant improvement in the teachers' compliance measures during the implementation phase reveals some significant findings around the teachers' capacity to deliver their GCA lessons, or more specifically their capacity to translate GCA theory into practice. During the implementation phase, Jenna demonstrated less significant growth in capacity with a 15% increase in her compliance score, compared to the 29% increase in the lesson planning phase. More significantly, Sarah's compliance measure remained unchanged between the two phases, showing no change in her capacity to implement GCAs. The teachers demonstrated less significant gains in capacity when delivering their lessons in practice, compared to planning their lessons, suggesting the teachers had difficulty when delivering their lessons, or more specifically when translating the GCA theory in practice. As such, there is a notion that planning, and practice can demonstrate different results. The teachers required further support when attempting to deliver their GCA lessons. Moreover, during this implementation phase, Jenna was more consistent and more successful in demonstrating the GCA benchmark elements when delivering her lessons, showing a greater degree of faithfulness and more authentic delivery of GCAs. These findings reveal significant differences between the two teachers,

with Jenna, the more experienced teacher, showing greater improvement in her capacity and more success in implementing GCAs in practice compared to Sarah.

Observations of the teachers' lessons, along with the teacher and researcher interviews, corroborated these findings. Early discussions with the teachers showed that they had some idea of what they wanted to plan but struggled to see what this looked like in practice. They had difficulties taking the GCA theory from the researcher and the provided resources and putting it into practice. The following teacher interviews reflect how both Sarah and Jenna struggled to grasp the concept of the lesson, with comments such as, "I think I just need time to actually wrap my head around what am I wanting them to achieve or learn or do - Individual things. I guess maybe so it does run smoother during the lesson" (Sarah, Teacher interview, 23 May 2014). And,

> I just think it is just a greater understanding of the purpose of the lesson and how to differentiate the differences because sometimes I do not always clearly see the difference between possession and attack because if you are attacking you are in possession, so they cross over. (Jenna, Teacher interview, 23 May 2014)

Clearly, there is some progression with Jenna's knowledge and understanding since she is starting to focus on the tactical aspects of the game. However, the link between possession and attack is not clear. She is not able to see that one can be in attack without possession and defensive with possession. As such, it appeared that her limited knowledge and understanding impacted on her capacity to implement the GCA element in practice.

The researcher noted the difference in capacity between the teachers. This disparity was evident in her discussion regarding teachers' progress with the expert panel,

> I thought Jenna's lesson was stronger. In terms of GCAs, I think that she showed better knowledge and I thought that she showed better pedagogical skills. She moved around a lot more and visited those individual groups. I think some of her questioning was good, some of it wasn't relevant to the learning outcomes and I don't feel that she addressed the three main questions from that lesson plan, but I do think that she modified games beyond what was in the lesson plan. (Researcher, Expert Interview, 21 May 2014)

Similarly, in reflecting on their lesson implementation as part of the PD process, Jenna noted her continued progress, stating "I think it went well" (Jenna, Teacher interview, 23 May 2014) and again in a later lesson noting, "Mine ran smoothly actually" (Jenna, Teacher interview, 13 June 2014). In comparison, Sarah's provides a more critical reflection of her lessons, stating, "I thought it was shocking!" (Sarah, Teacher interview, 13 June 2014) and again, noting how she struggled to get through the planned content,

> Well, I do not know if I am just not getting through as much as maybe we think we can in the lesson and maybe that is me spending time setting up while they are doing something else so maybe the activity they are actually doing it for a lot longer than they need to in order to get the point of what they are doing. (Sarah, Teacher interview, 23 May 2014)

Even from this early observation, Jenna's competence over Sarah was observed, suggesting her teaching experience may have impacted her capacity to implement GCAs. Closer analysis of each element highlighted the specific areas that the teachers required further and ongoing support with when delivering their GCA lesson, whilst revealing further disparity between the teachers. These findings further guided the PD process, informing the researcher of the specific areas of GCAs that the teachers needed support. For example, Sarah needed ongoing assistance with classroom management and the use of questioning strategies, where the researcher was able to step in and support Sarah in her lessons, and she continued to use the questioning scaffolds (see Appendix 22).

Despite both Sarah and Jenna showing marked improvement in their compliance scores for the communication and assessment elements (elements 5 - 8) when implementing their planned lessons, the disparity between the scores showed the difference in capacity between the teachers. Jenna's compliance measures for elements 5. Teacher uses clear communications for situated learning tasks and element 7. Teacher provides a review that includes the tactical problems of the lesson, and to a lesser degree element 6. Teacher uses high rates of guides and feedback during situated learning tasks, were substantially higher than Sarah's, with a far greater increase between the lesson planning phase and the lesson implementation phase. As such, Jenna was better able to consistently demonstrate these elements when delivering her lessons, demonstrating greater capacity to implement these elements in practice than Sarah. There was one exception, element 8) Assessment, where Sarah showed a greater increase in capacity when delivering her lessons compared to Jenna.

Further supporting Jenna's greater capacity around implementing these elements, the Researcher makes the following notes when observing her lesson; Jenna provides "very clear instructions at the start of the lessons", "Jenna works well engaging with individual groups," and the "Class is kept on task as she moves around different groups" (Lesson observation, 16th May 2014). Again, in a later lesson, the researcher comments, "Great communication throughout lesson" (Lesson observation, 13th June 2014). As expected with an experienced teacher, Jenna appeared far more at ease with the situated nature of the learning or possibly had better knowledge and understanding, which lead to more effective implementation of GCA lesson. In contrast, Sarah's lesson observations further exposed her inexperience and difficulties implementing these elements in practice, where it was clear she required further support in delivering her lessons and translating the GCA theory into practice. These difficulties are discussed in detail below when revealing the specific areas, the teachers required further support.

The disparity between the teachers may suggest that the PD had better developed Jenna's capacity to implement GCAs than Sarah's, suggesting the PD process had a greater impact on supporting Jenna's teaching and learning and facilitating change to her teaching practice. Equally, these findings may suggest that Jenna, the more experienced teacher, had a greater capacity to translate the GCA theory into practice, compared to Sarah, the newly qualified teacher. As such, these findings could indicate that teaching experience may impact on teachers' capacity to implement GCAs, or more specifically, on teachers' ability to translate theory to practice. Jenna was a more experienced teacher, having taught at the same school for 13 years, compared to Sarah, who had only graduated from University two years previous. Jenna's years of teaching may have provided her with a greater skill set to manage a lesson and game environment, perhaps better allowing her to focus on the pedagogy proposed by the PD. Perhaps Jenna's more extensive teaching experience had provided her with greater capacity to use a wider range of teaching approaches, along with a deeper knowledge and understating pertinent for teaching using games-based pedagogy. Jenna supports this in one of her own comments, in response to the comparison of Sarah's lesson to hers, stating "I guess maybe that just comes with more teaching experience, more coaching experience" (Jenna, Teacher interview, 23 May 2014). As such, it is possible that the more teaching experience a teacher has provides a better platform for supporting the implementation for GCAS.

Translating theory into practice - Elements requiring further support

The continuous and simultaneous collection and analysis of the data throughout the PD process allowed an ongoing assessment of the teachers' needs. The data analysis from the observational benchmark tool, teacher interviews, Post-teaching Reflective Analysis (PTRA) and the researcher observations helped identified the specific areas where the teachers required further support. The data analysis further informed the PD process, whereby the researcher tried to tailor the PD to scaffold and support the teachers' implementation of GCAs. The initial needs-assessment attempted to explore the teachers' individual needs regarding GCAs and identify the specific elements requiring support. However, it was not until planning and the implementation phase, that these specific needs or elements for support were identified. These findings show that as the PD progressed and the teachers were engaged in reflective practice, the teachers' capacity grew, along with as their knowledge and understanding of GCAs, where they were better able to identify their needs. The findings here highlight the importance of the AR nature of the PD and the importance of the Researcher's continuous assessment of the teachers' needs throughout the PD process.

The findings through the implementation phase showed that both Jenna and Sarah's compliance scores for elements 1. Creating a tactical problem as the organising centre for learning tasks, 3. Teacher identifies needed tactical and skill areas from game form, and 4. Teacher uses deductive questions to get students to solve the tactical problem, three of the four 'non-negotiable' elements' decreased when delivering their lessons. Further exposing the disparity between the teachers, Sarah's compliance scores for these elements, dropped more when compared with Jenna's, further highlighting the disparity between the teachers and the greater difficulties she had putting these GCA elements into practice. The findings also exposed Sarah's difficulties around modifying and adapting games when implementing her lessons, showing the greater support she needed when implementing her GCA lessons. Again, these findings could be related to the amount of teaching experience she had compared to Jenna.

The teachers' planning and practice yielded different results. These findings suggest that the teachers had difficulties implementing these key GCA elements in practice, despite having planned for them with the support of the researcher in the lesson planning phase. There

appeared to be a breakdown when it came to translating the GCA model into practice. These findings subsequently informed the PD, where greater support was needed when implementing their lessons. The researcher attempted to do this during the lesson by team teaching with the teachers, stepping in to support when the teacher appeared to need it. Clear improvements were made in the teachers' final lesson with significantly improved compliance to GCAs for both teachers.

A tactical focus for games

Both Sarah and Jenna's compliance measures for elements 1) Creating a tactical problem as the organising centre for learning tasks, and 2) Teacher identifies needed tactical and skill areas from game form, decreased when implementing their lesson. Although Jenna's compliance measure was still at 63% for these elements, this was still a substantial decrease (37% and 33% respectively) from the lesson planning phase. Moreover, despite Sarah's University experience with GCAs and her lessons plans showing evidence of the tactical games' elements (elements 1 and 3), when it came to applying the model, or theoretical principles to practice and delivering her lessons, she struggled, with a compliance measure of 50% and 42% respectively.

In particular, Sarah experienced difficulties surrounding lesson and game management around a tactical focus, difficulties typical of a newly qualified teacher, showing her inexperience in teaching. Often the opening activity did not highlight the focus for learning within the lesson or set the scene for the development of tactical awareness and decision-making. The researcher made the following observations of Sarah's lessons,

> They [the students] were not presented with a focus question or problem to solve. Sarah set the kids off, but they were very unsure of what actually to do. Sarah was not able to pose questions or tactical problems within the games, as the groups were too far apart. She just set them off to play the game and watched from afar. She had very little input into the games. (Lesson observation, 16th May 2014)

Sarah attempted to explore what the students had learnt at the summation of the lesson. However, the lack of tactical focus throughout the lesson meant that the plenary involved a review of the lesson activities, rather than a summary of the students learning. For example,

> Sarah conducted a good plenary session at the end that summarised the lesson but again there didn't appear to be a tactical focus to the lesson. It was more a review of the lesson content and the aim of the activities. This would have been a great opportunity to drive home the focus of the lesson. (Lesson observation, 16 May 2014)

Furthermore, in a later lesson, "Sarah failed to focus learning around a tactical problem and didn't set up a problem to be solved" (Lesson observation, 30 May 2014). The class were not asked to solve a tactical problem and explore the different ways this might be achieved. In Sarah's reflections, she did note her goal for the following lesson to "teach the students how to set up an attack to score a goal" Sarah, PTRA, 16 May 2014), showing her ability identify the tactical focus in games as an area to be developed and suggesting her capacity to identify her learning needs was developing.

It appeared that when the content moved outside of the teachers' 'sphere of expertise', that is, a movement skill orientated view, the teachers were challenged by connecting the teaching and learning activities used, with the game concepts they were trying to get the student to understand, or more specifically, the tactical problem they were trying to solve. Informed by these findings, the PD was tailored to build the teachers capacity around implementing these tactical elements of GCAs in practice and into their lessons.

In contrast, Jenna appeared more adept. Her lessons showed that she was able to set a tactical problem to be solved, however, rather than letting the class explore the different ways that this might be achieved, she got them to explore it verbally before going into games. The researcher notes,

> She [Jenna] didn't leave a problem to be solved. She started the session with the question and answered it there and then without letting the students explore the activities and come up with the answers. She asks the question and gets the answer there and then rather than letting them explore the answer. (Lesson observation, 16 May 2014)

Jenna was progressing but her limited experience with GCAs and answering questions for students is evident. Answering questions for students is a typical issue with questioning, on average teachers wait for one second or less after posing a question (Cotton, 2001). However, in this case, it might represent Jenna trying to keep control of the learning environment. Jenna

appeared uncertain about the lesson purpose and content knowledge which perhaps started to cause overload. The researcher comments,

> Jenna works her way around the groups really well and is able to guide learning, she is able to work well with the defender and give guidance to how to help the defender. However, the focus of this lesson is attacking and passing. She doesn't seem to have a very clear focus. (Lesson observation, 16 May 2014)

These findings suggest that Jenna is challenging her old pedagogical beliefs and practice but possibly still battling with the proposed GCA pedagogy and trying to control the learning environment, perhaps with some fear that it may lead to areas where she is not strong on content. Both teachers needed further support in establishing a learning intention to focus learning and direct teaching and learning activities and game modifications, to successfully implement GCAs. Subsequently, the PD process needed to be adapted to support the teachers in developing the capacity around this area.

Questioning

Sarah and Jenna's compliance measures also dropped for element 4) Teacher uses deductive questions to get students to solve the tactical problem when implementing their lessons. Again, Sarah's compliance measure dropped more than Jenna's from 80% to 50% when delivering her lessons, whilst Jenna's only dropped 20% from 83% to 63%. Further analysis of the data showed that Sarah required considerable support around the use of questioning through the planning and the implementation phase. When reflecting on her learning during the planning phase, Sarah recognises her need for support around questioning, commenting,

> I think just more of an idea of the questions, like the questioning, um, like questioning technique really, getting that down… I think it's just probably being able to remember the questions that I want to ask. I think that's the only downfall I might have… It's just remembering that, the focus of the questions like what I actually want to ask them to get what I want out of them. (Sarah, Teacher interview, 16 May 2014)

Furthermore, in her lesson reflection, noting "I think my questioning could be improved. I didn't remember the questions I originally wanted to ask" (Sarah, PTRA, 16 May 2014). In attempting to address each of the GCA elements, Sarah appeared overwhelmed with the number of elements she had to remember in order to effectively implement GCAs, raising an

interesting point regarding the use of all eight benchmarks as a measure of capacity with beginners learning a new approach.

During the implementation phase, the findings showed that Sarah did attempt to use questioning in her teaching practice. However, she still required ongoing support. Reflecting on her lessons, Sarah notes "I guess just wrapping my head around all the questions. I was trying to remember things that I wanted to ask" (Sarah, Teacher interview, 23 May 2014), and

> Like I said, I have been trying to do it with other classes, but I probably only asked maybe two questions where I think in that one there were six or something and I felt it was too much. By the time you get a few kids' responses then you are going to be sitting there 15 minutes and I think that is too long. (Sarah, Teacher interview, 23 May 2014)

Subsequently, in order to support Sarah and build her capacity in using questioning strategies, the researcher developed some questioning scaffolds (see Appendix 22) to support Sarah's use of questioning in her lessons. The collaborative nature of the PD allowed the researcher to support Sarah's learning by getting her to identify three focus questions that would facilitate learning each lesson,

> We only ever have two or three focus questions. We go through and look at some other questioning and try to anticipate what the kids will do or what we hope to see, but there is nothing wrong with sticking to those two or three questions throughout the entire lesson and just asking those questions. As you get more skilful at this approach you will be able to identify what is going on in the game and say oh right, okay – like you have already started doing – why did you do that? How are you doing this? I guess for your understanding the concept and having those questions there beforehand but then building your confidence to identify it in a game. (Researcher, Teacher interview, 23rd May 2014)

More adept, Jenna did not seek support with the use of questioning and appeared confident in her ability to use questioning strategies within her lesson. The researcher comments, "She [Jenna] conducted a good question and answer regarding the rules for Netball. Jenna's class management and questioning are far better. She is very clear and articulates well" (Lesson observation, 16th May 2014). Despite Jenna's observed capacity to use questioning strategies,

the researcher identified a need to focus on Jenna's use of questioning on what she wanted the students to learn. For example, "Jenna asks some questions 'what do you need to do differently now?' which is good but needs to try and facilitate learning around the aim of the lesson i.e. possession, passing etc. Need to plan some questions with her" (Lesson observation, 16th May 2014), and "There is a clear lack of connection between Jenna's questioning and the aim of the lesson" (Jenna, Lesson Observation 2, 21 May 2014). As a result, Jenna "struggled to get significant information out of them [the students]. She tended to ask questions and then answer them because she wasn't able to get the response she wanted out of the students" (Lesson observation, 16th May 2014); a possible pitfall of planning questions to ask.

The findings here may reflect the limitations of Jenna's knowledge and understanding, where she possibly wanted to answer the questions to direct the learning or perhaps not have her own knowledge and understanding challenged. It appeared that the use of questions and inter-student dialogue seemed to create an out of control lesson, which clashed with her perceived role as a teacher. These findings highlight issues with coherence, where Jenna's knowledge and understanding of what her role is and how she teaches are challenged. The findings during the implementation phase suggest that the teachers had limited knowledge and understanding of how to formulate relevant questions in order to deduct the relevant response from the students, and how to focus and facilitate learning using questioning techniques. These findings are unsurprising given the teachers' difficulties seeing the tactical problem in play; questions are of little value if you can't see the problem to be solved, you will not know the answer.

Assessment

Analysis during the planning process revealed that the teachers had limited knowledge of how to conduct authentic assessment in a practical setting, or more specifically, how to implement authentic assessment that assessed games performance or at least assess skill performance situated in the context of a game. Furthermore, they were not familiar with any assessment tools that would help them assess game performance. The researcher made the following comments in her reflective journal, "I'm really not sure they have any idea about assessment and haven't thought about assessment at all through their practical units. It appears that they used to do skill tests and only through observation." (Researcher reflective

journal 16th May 2014) and "they were not able to identify how they would best assess the students' knowledge when participating in the planned learning activities or more specifically, what student behaviour to look for in the lesson" (Researcher Reflection, 23 May 2014).

Analysis of the teacher interviews revealed that previous assessment in PE involved observing students during isolated skill drills and their level of skill when playing full-sized games then assigning them a subjective grade based on their technical performance. Jenna explains, "Some of it would just be a specific skill base, how they can do things, and another really is an impression mark of the game" (Jenna, Teacher interview, 6th June 2014). The teachers had limited knowledge and understanding of how they would assess game performance or how to assess students' knowledge and understanding when playing games. These findings are unsurprising given the focus of their PE program was on sport, and there was no guidance from a Head Teacher.

Analysis using the observational benchmark tool showed no evidence of assessment in the unit overview, lesson plans in the planning phase, or the lesson observations in the implementation phase until lesson four of Sarah's and lessons five of Jenna's, which was specifically assigned an assessment lesson. Neither teacher reflected on any assessment opportunities in their lesson reflections. Initially, the teachers had decided the best method of assessment in this context was to assign two weeks at the end of the unit for a tournament, where they assess students whilst playing games. The teachers showed no evidence of ongoing, formative assessment and made no opportunities to gather ongoing evidence throughout the unit. During week four of the six-week unit, the teachers decided they needed to assess the students and that they would prepare a formal assessment to be conducted the following week. The researcher makes the following comments in her notes:

> The focus of this meeting seems to be on assessment, I wonder why they haven't thought of this before now. Shouldn't they be planning their units with assessment at the forefront of their teaching, do they even know what it is they want the students to learn in this unit?
>
> (Reflective journal, 6th June 2014)

In order to build the teachers' capacity in planning and implementing authentic assessment in this setting and develop their knowledge and understanding of assessment strategies relevant

to GCAs, the researcher introduced the teachers to the Games Performance Assessment Instrument (GPAI) (Oslin, Mitchell & Griffin, 1998) and the Team Sport Assessment Procedure (TSAP) (Gréhaigne, Richard & Griffin, 2005). The researcher provided the teachers with several examples including peer assessment, self-assessment and teacher assessment (see Appendix 15 & 16) showing how they could assess game performance behaviours such as tactical understanding, as well as the player's ability to solve problems by selecting and applying the appropriate skills. Several studies have used the GPAI to assess game performance (see Casey & Dyson, 2009; Memmert, 2010; Memmert & Harvey, 2008, 2010;) and the TSAP to measure game ability (see: Arias & Castejón, 2012; Gréhaigne et al., 1997; Nadeau et al., 2008).

The teachers selected a GPAI peer assessment that focused on supporting the ball carrier and a teacher assessment that focused on effective decision making, support and skill execution, with the assumption that the students understood these concepts. However, the teachers encountered problems when delivering the lesson that implemented the assessment tool. The researcher comments on the difficulties Sarah experienced setting up and conducting the assessment, commenting,

> She [Sarah] provides a bit of a jumbled verbal description of the activity. I really wish she would give a visual demonstration. Especially with this assessment sheet. They really need to be given an example of what they need to do. She needs to clearly illustrate what appropriate and inappropriate support is.
>
> (Lesson observation, 13th June 2014)

While the PD had supported the teachers in planning the assessment with the use of the assessment tool, translating this into practice was more difficult, especially for Sarah, who was only just building her capacity to teach.

It was clear that Sarah was not clear herself on the activity at hand and struggled to articulate the task requirements to the students. As a result, the learning focus was lost in the lesson, it was clear that Sarah did not understand the GPAI and she was not able to make the learning intentions clear to the students. The researcher notes that "The lesson appears very disorganised and disjointed" and "I can sense that she feels very uncertain about this lesson and she is not clear what she is doing" (Lesson observation, 13th June 2014) highlighting Sarah's limited knowledge and understanding of assessment. Sarah's inexperience was

evident. She tried to implement the GPAI based on the collaboration with the researcher and Jenna. However, the use of the assessment tool added further demands adds pressure on Sarah, who is an inexperienced teacher trying to implement GCAs, manage the class, select appropriate activities and progress, and question students. She appeared overloaded with all the instructional requirements; unsurprising given Sarah was still just developing her capacity to teach.

In contrast to Sarah's lesson, Jenna's assessment lesson demonstrated sound knowledge of assessment and a better understanding of the GPAI. The researcher comments, "She [Jenna] provided a very clear verbal explanation of the set-up of the game and the actual activity to her class", and she is "very clear with her verbal directions, she is confident and very descriptive" (Lesson observation, 13th June 2014). However, in implementing the assessment process for the first time, the lesson observation showed that Jenna did not cover all aspects of the planned assessment. The researcher also notes, "it is clear to see that she has forgot what the peer assessment is about, she again explains to the students about what her assessment is" and "She doesn't use the right language [Language used in the GPAI], rather than saying appropriate and inappropriate" (Lesson observation, 13th June 2014). Jenna demonstrated better knowledge of assessment through the teacher assessment, "Jenna is able to assess the students and is filling in her teacher assessment" (Lesson observation, 13th June 2014).). However, she still demonstrated limited knowledge with the peer assessment. Despite the teachers implementing the GPAI and showing improved knowledge around authentic assessment, this is one area in particular that required further work. Whilst overall, Jenna, the more experienced teacher, better managed the assessment, she still encountered difficulties, forgetting some aspects of the assessment, particularly the peer assessment components. These findings suggest that is perhaps too demanding to expect the teachers to implement both the teacher assessment and the peer assessment at this beginning stage.

Despite Jenna's compliance measure for this Assessment element, showing an increase between the planning and implementation phase, this growth in capacity was minimal, with only a 21% increase when implementing her lesson. Moreover, Jenna's compliance score for element 8. Assessment, was significantly lower at only 38%, compared to 50% for Sarah, making this Jenna's most poorly executed element. Moreover, in the dedicated assessment lesson where both teachers planned to implement the GPAI both as a teacher assessment and as a teaching and learning activity where the students carried out a peer assessment, Lesson 4

for Sarah and Lesson 5 for Jenna, the compliance measures for all other benchmark elements dropped. Jenna's compliance measure for that lesson dropped to 50%, and Sarah dropped to 25%. The teachers were not able to focus on implementing all the other benchmark elements whilst focusing on assessment, suggesting the teachers were perhaps overloaded with information trying to focus on all the elements. In the interview following the lesson, the researcher notes:

> When you went into the assessment lesson you kind of forgot that tactical focus. The focus became the assessment and yes it was for the students as well to do that peer assessment but in the games the tactical focus was 'support' and we kind of forgot that. Because you… I think you were so focused on assessing, trying to get the students to assess, you didn't really look for that tactical problem or set up those… that questioning around that tactical focus.
>
> (Teacher interview, 13th June 2014)

It appeared that both Jenna and Sarah were overloaded with information when learning about the GPAI and trying to conduct it in practice, especially when trying to implement both the teacher and the peer assessment. The teaching and learning culture within the faculty was one of no assessment and a habit of no accountability for their practice, which may be common in PDHPE; Physical Education Teachers, unlike classroom teachers, generally have not felt obliged to demonstrate student achievement of goals in a formal and systematic way (Mercier & Doolittle, 2013). Given Jenna's presiding focus on skill-based practice and possible entrenched beliefs about teaching and learning, these findings could support further suggestions around the teachers' limited capacity to implement authentic assessment in practical lessons. Sarah, being a newly qualified teacher, would have learnt about authentic assessment practice as part of her recent University studies. The teachers required more support around the use of the GPAI and authentic assessment in their practical lessons. Further support was needed to build teacher capacity around authentic assessment in games.

A possible explanation for these findings is that the planning phase permitted a greater focus on the benchmark elements, in order to structure their GCA lessons better. Whilst planning, the teachers could easily consult the support resources and remind themselves of the instructional processes required in the GCA when hen planning their lessons, in order to scaffold their planning. Consulting the resources proved to be more difficult when implementing the lesson, despite the teachers' reading from their lesson plans when

delivering their lessons. The researcher notes, “She [Jenna] is still relying heavily on the lesson plan…” (Lesson Observation Jenna, 30th May 2014) and “Jenna reads a lot from the lesson plan. I don’t feel like she has a good understanding of the lesson” (Lesson Observation Jenna, 30th May 2014).

Similarly, the researcher was at hand during the planning phase to direct the teachers’ attention to the elements. However, it was more difficult to provide this level of support during the actual lesson delivery, due to the practical nature of the environment. The researcher was less able to step in and support the teachers’ learning without disrupting the flow of the lesson and student learning.

The gap between planning and implementation is evident here, Jenna is taken back to being consciously unskilled, clearly an uncomfortable position. However, perhaps an essential stage of the change process and something that reflective practice can build into PD. While resources were provided, it appeared that the volume of content to cover was too much for the teachers, particularly considering the starting point and the limited time allocated by teachers to the planning phase. In implementing GCAs, such was the lack of unfamiliarity with GCAs, that even experienced teachers like Jenna needed to consult her notes. These findings have implications for GCA PD since the teachers are at different levels, which impacts on the collaboration and what capacity and content they need, also, some parts of implementation have to be prioritised over others, adding to the complexity of the PD. The teachers had difficulties demonstrating all elements of the GCA during the initial stages of the PD process. Therefore, asking the teachers to demonstrate all benchmark elements from the onset of the PD might have been too challenging. The onus is on the PD provider, in this case, the researcher, to make decisions as too the GCA elements that will be prioritised. These findings may also suggest that the duration of PD was too short for the PD to penetrate the teachers’ assessment practice. More time was needed to develop this element.

Modifying and adapting games

The findings during the implementation phase, show that both Sarah and Jenna experienced difficulties modifying and adapting games to address the learning goal of the lesson and to cater to the different learning needs of their students. These findings possible reflect the teachers’ difficulties around transferring their lesson plans into action, or more specifically,

the theory into practice. The PD had supported the teachers to identify what they wanted to achieve through their lesson plans, but there was a disconnect in practice. The researcher notes these issues in her observations:

> She [Sarah] wasn't able to adapt the games to suit the students' abilities. One group was very able and needed to be challenged… The able group of students picked up that they didn't have enough room to experience success and asked if they could make the playing area bigger, but Sarah refused. (30th May, Researcher observation, 2014)

The teachers appeared to have difficulty identifying learning in situ and making relevant game modifications to support learning, whilst the activities were underway, and learning was unfolding in front of them. In observing one of Jenna's lesson, the researcher comments:

> She [Jenna] has worked around each group and has tried to introduce some modifications i.e. you can't use shoulder passes - I am unclear why she has chosen these modifications. The focus on the lesson is possession and passing, she needs to be recognising that the shoulder pass is a good pass to get around the defender. She seems to be modifying the games to help the defender not the attacker. A better modification would have been to introduce a 3 v 2 or a 4 v 2. Far more attention needs to be payed to introducing modifications that reflect the aim of the lesson. She needs more practice on how to modify games to facilitate learning around the aim.
>
> (Lesson observation, 16th May 2014)

Jenna attempted to modify and adapt the games whilst the students were engaged in the activity, showing some good GCA practice. However, the modifications she made did not replicate the game scenario or highlight the learning intention. Her modifications did not contain the same tactical structure as the advanced version of the game, losing connection with the original sport she was trying to teach. It was clear that Jenna's modifications were in line with movement execution, as per her usual beliefs about teaching and learning, or her knowledge base which is the defensive role within the game. As a result, the game modifications used did not highlight the learning intention of the lesson or direct the students to solving the tactical problem which was focused on attack.

Similar difficulties around modifying games, in this case, to address the students' needs and ability, were observed in Sarah's lessons, as the following example illustrates,

> The second game showcased some good tactical play and use of space. Although the playing area set up was far too small. Again, Sarah made her way around each group but didn't really facilitate any learning. She wasn't able to adapt the games to suit the students' abilities. One group was very able and needed to be challenged. (Lesson observation, 30th May 2014)

Furthermore, "I feel that she [Sarah] has given them a bit too big a space for the defender to achieve maximum success. She needs to make the playing area smaller" (Lesson observation, 18th June 2014).

Further observations reinforce this disconnect between their lesson plans and their actual implementation. Sarah attempted to make modifications in her lessons, which showed progress, although, her modifications did not always support the learning intention or the tactical focus. These somewhat random modifications had clear implications on the students' success in the activities and on them achieving the learning outcomes. The researcher notes the following in one of her reflections:

> Differentiation and modifications were the weakest elements when planning the lesson. They didn't understand the types of activities they needed to be using or how to structure a learning activity to ensure learning was happening or to highlight the outcomes to be achieved.
>
> (Researcher reflection, 18th June 2014)

The teachers also noted these difficulties in the teacher interviews, noting the continued need for the researcher's support,

> Yes, and how to differentiate possession to attack to space even though subconsciously I might know it, it is going to take a lot – I guess with your prompting I will probably just go oh yeah, I would do that. (Jenna, Teacher interview, 23 May 2014)

Reassuringly, these findings demonstrate the teachers improved capacity to reflect on their lessons as part of the PD process where they were able to identify adapting and modifying games area of need, something they were not able to do at the start of the PD process. For example, Sarah notes, "I would give the students a larger space for the 2v2 plus wall players activity. It could also be good to do it on 2 different sized fields so that the students can understand how space makes a difference" (Sarah, PTRA, 30th May 2014). Despite her

struggles in the lesson, these reflections show her growing capacity to identify what is required as part of GCA lessons, a marked improvement from the beginning of the PD where the teachers were not able to identify what they needed to support their learning. Similarly, Jenna notes her teaching and learning goal for the following lesson, “I will modify and adapt games higher or lower to meet their abilities so success can be achieved by all” (Jenna, PTRA, 16 May 2014). Jenna recognises her improvement in the following lessons, noting, “I was able to make two variations to attacking the goal. Different size areas had varying points values which became an incentive” (Jenna, PTRA, 21 May 2014).

In the needs-assessment phase, the teachers had chosen to teach within a sport that they had the most confidence, content knowledge and experience, Jenna in Netball and Sarah in Soccer and Fred in Touch. It was believed that this would support the teachers’ learning by allowing the PD to focus on the instructional practices associated with GCAs and developing their pedagogical knowledge. However, the knowledge evident was framed in such a way that it was either aligned with a certain position of play within the game, or within a certain method of teaching, whether that be movement based or teacher providing feedback. The teachers demonstrated some capacity to design modified games in planning, but when implementing their lessons, their capacity to recognise the permeations in play and the ability to articulate these meaningfully and create game forms to explore these seemed to create issues relating to overload. The researcher makes the following observations, “I don't think she [Sarah] was able to step back and see what was going on in the game” (Lesson Observation 1, 16 May 2014). And, “Jenna seems knowledgeable and has great classroom management but I’m not sure she knows what she is looking for in the lesson (Sarah, Lesson Observation 1, 16 May 2014).

Jenna, the more experienced teacher, has a sound knowledge base but needs to develop her content knowledge around the things she wants in the lesson and what they look like in action. Whilst the PD had built the teachers capacity. They still needed ongoing support in designing and modifying games to create learning experiences shaped around the tactical problem. They also need support to then manage the lesson changes to keep the focus on that problem. The findings here further indicate the individual needs to the teachers, whilst both teachers shared some common needs, here it is possible to see that they needed different things separate to each other, Sarah specifically around questioning and Jenna around authentic assessment. Jenna, the more experienced teacher, demonstrates the capacity to

manage students, where the PD must now focus on developing further depth of GCA knowledge. Whilst Sarah, more inexperienced, needs a more scaffolded approach with some clear parameters to allow her to feel comfortable managing a class. These findings possibly suggest that Sarah, a beginning teacher, might not be ready to use a GCA yet. It might be that Sarah needs to build her teaching capacity first, focusing on classroom management before learning to implement GCAs.

Time

A consistent and reoccurring theme throughout the PD process was the teachers' perception of time as a barrier to their participation in the PD. They also perceived implementing GCAs to be a timely process. However, the findings show that the teachers prioritised other school activities and commitments over that of the proposed PD. Moreover, the limited accountability for the teachers teaching practices and their participation in the PD had a significant impact on the time they made available or prioritised for the PD.

Despite initially identifying collaboration as a means of supporting and scaffolding the teachers' unit planning, Barry later identified the time constraints with such a collaborative approach. Barry states, "Well, we are starting from a place, well, I am starting from a place of ignorance, so if we are designing it [GCA unit plan] together, I just see the time constraints with that [collaboratively planning the unit/lessons]" (Barry, Teacher interview, 20 March 2014). Even at this early stage of the PD process, time was perceived as such a barrier for Barry, that he decided to withdraw from the study, claiming limited time to be the deciding factor for his withdrawal. Barry explains:

> Well I'm actually thinking that I am going to be out of it. I'm not teaching Year 8's [the chosen year group for this study] and with my sport stuff, I don't think I have enough time to take part in this. (Barry, Teacher Interview, 20 March 2014)

It appeared that Barry was focused on the short-term goals of teaching his timetables classes, not seeing the role of the PD and the overall, long-term value to improving his teaching practice. Barry possibly placed little value on the PD and its role in improving his professional practice. With no one driving the PD and no accountability for his participation, it was easy for Barry to disengage from the PLC and withdraw from the PD.

Some attempt was made to find time to plan the unit collaboratively. However, it was clear that the collaborative approach proposed was going to be difficult due to conflicting priorities, timetable constraints and other school activities impeding the planning phase. The following extracts from a range of email correspondence illustrates these difficulties, "Fred just reminded me that he won't be in on Monday. So, if you would rather come in on another day that is fine too. There is no time though, that all of us are off together" (Sarah, email correspondence with Researcher, 19th March 2014), and

> Seems we are all forgetting appointments. No point coming in for Year 10 tomorrow, the Year 10s have an incursion [in school] during our lesson in HSIE. Jenna and Sarah have also told me that Year 10 on Thursday is also out on an excursion. Friday is an option if that suits, 10:30 for Year 8, 11:36 for another Year 8 class, then after lunch 1:25 with Year 10 till 2:27. Sorry but everything is up in the air.
>
> (Fred, email correspondence with Researcher, 30th March 2014)

The researcher had similar difficulties:

> I know we agreed for me to come in on Tuesday from 10.30 and teach Fred's lesson, followed by another lesson and then Sarah and I had agreed to work with her the last 2 periods. However, I have an appointment at 12pm that I didn't have marked down in my Calendar. Is there any way I can come in on Thursday as well or instead?
>
> (Researcher, email correspondence with Faculty, 30th March 2014)

The various demands placed on the teachers impacted their priority and accountability to complete the 'resource reading' as part of the unit planning preparation. Jenna claims, "I've been flat out" (Teacher interview, 28 March), whilst Sarah states, "I haven't had time to look at it" (Sarah, Teacher interview, 28 March). Activities as part of the PD process appeared to be lower on the teachers' list of priorities in comparison to other activities. With no Head Teacher or anyone driving the PD, along with the variations in priority and beliefs about what was needed for the PD and why the organisation was difficult. There was no one really leading or driving the PD to take charge of the decision making and lead correspondence.

The teachers only perceived the time available for PD to be within the hours of the school day and what they may consider their job (between 8.30 and 3.00). However, they struggled to prioritise time during this short period to plan the unit of work collaboratively. Sarah notes,

> Yeah. That's the thing! There is no time when we are all off together. That Monday, it's you and me off then you and me again and then Fred and I are off. Do you know what I mean? So even if it's us [Sarah & Jenna] starting, and developing the unit overview, you know what I mean? That might happen quite a bit but that's…that's our second week actually.
>
> (Sarah, Teacher interview, 11th April 2014).

Subsequently, it appeared that the planning process was not conducted collaboratively with the whole faculty as planned. Instead, Sarah completed the task with some minimal input from Jenna, despite seeking leadership and support from within the faculty. Sara notes,

Realistically, Jenna probably helped me for 15 minutes, because that's all the time that she had, because she had to do the other thing. Fred didn't even get a chance to really look at it because he had so much, he needed to do in terms of he just got a new timetable and he's in another faculty for half his lessons. (Teacher interview, 1 May 2014)

The researcher notes her disappointment surrounding this lack of collaboration and the teachers' limited time prioritised for the PD in the planning phase, commenting,

> I was disappointed to find out that neither Jenna nor Fred really helped her [Sarah]. Their priorities were with their senior classes and with sport. I understand these constraints and the pressure from having to teach these things, but I am always amazed at what little time and preparation goes into teaching year 7 – 10 PE. (Researcher reflections, 1st May 2014)

The prioritisation of time appeared to be a key issue, with Senior students taking precedence, possibly a reflection of the whole school aims. The overall collegiality of staff to each other to improve as a collective was questionable.

Collaboration was a key feature of this PD model, with the findings reinforcing its importance in supporting teacher learning. This collaborative element of the PD process highlights the significant difference between the model proposed in this study and traditional models of PD. However, it appeared that the time made available for PD might not have been enough to allow collaboration and build capacity, and possibly not enough for the PD to be successful. The proposed PD model requires some input from the teachers; if the PD is going

to support the teachers learning there needs to be 'buy-in' from the whole faculty, they need to be invested in the process. Sarah and Jenna both expressed their need for support both collegially and from the researcher through the planning process in the needs-assessment. This need for collaboration was reinforced in the planning phase. However, there appeared to be limited collaboration, involvement and 'buy-in' from Barry and Fred. In considering the barriers in the planning phase, Sarah notes the absence of the other teachers in the collaborative process commenting, "For planning I guess having someone to do it with, missing out on that collaboration process" (Sarah, Teacher interview, 1 May 2014), highlighting that collaboration from all faculty members would have added value to the unit plan and assisted the planning process. It was at this early stage of the PD process when the teachers were anticipating the level of commitment and collaboration required to prepare for implementation of GCAs that both Fred and Barry started to disengage from the study. These findings precursor the later separation between the faculty members and possibly indicated the teachers' perceptions on what this collaborative process may require from the teachers and the level of commitment required for the PD process to support the implementation of GCAs.

The teachers maintained that time was a barrier to the lesson planning phase. Despite the teachers' decision to plan lessons on a lesson-by-lesson basis, taking into consideration the researcher's feedback, the teachers later perceived the barriers with such an approach. Jenna, perceived the agreed lesson planning process as 'inconvenient', noting,

> We're never going to have a time where we're kicking back with an easy day or plenty of time for you [the researcher] to come in… It's always going to feel a little bit inconvenient… We've got to make the time, is the time there? Yes, it is, it's just inconvenient. (Jenna, Teacher interview, 1 May 2014)

Similarly, Sarah notes her concerns regarding time in this planning process, commenting, "So then we're only going to have two days to plan a lesson, and that's not going to be enough time to plan a lesson and get feedback on it" (Sarah, Teacher interview, 16 May 2014). Like the unit planning process, other school activities were prioritised over the lesson planning. Sarah notes,

> I'll be honest, this week I really didn't make that a priority and yes because I've had two hyper days in a row I've just got, I don't know when I'm going to have a chance to actually look at the lesson and so I kind of made time this morning when I probably

> should have been listening to someone talking, but I wasn't and I was doing it then. It wasn't really relevant to me it was just a year assembly, and someone came into talk to the Year 12s but being a Roll Call teacher, I needed to be in the room, so I was like I'm going to use this time more wisely. So, I was looking at it then but that was really my first opportunity in, I guess, work time rather than I could have taken it home. I chose not to but could have. (Sarah, Teacher interview, 16 May 2014)

Jenna frequently used her commitments as a Year coordinator or HSC teacher to explain why she had not had time to plan or reflect on her lessons. On one occasion, the researcher even stepped in to teach Jenna's lesson, since she was too busy with Year 12 leavers activities to teach it. Interestingly, when reflecting on this barrier of time Sarah herself believed that lack of time was only "part of the problem" and that "the others they're using time as an excuse which I anticipated from the start" (Sarah, Teacher interview, 16 May 2014). Highlighting issues surrounding accountability and prioritisation of time for the PD.

There was no leadership for learning or anyone holding the teachers accountable for prioritising the PD. Time was perceived as an issue. However, when it came down to engaging in the PD outside of the teachers prescribed hours or not, it appeared that their actions did not necessarily match their desire to build capacity.

As with Barry in the needs-assessment phase (Phase A), this perceived barrier of time led to Fred's withdrawal from the study early in the planning phase. Fred explains,

> My current workload and commitments to my other roles within the school will not allow me to allocate the time you require for your study and outcomes. I know I am a committed teacher to my students, who respect my knowledge and dependability to them and their education. To only apply a small amount of time I have available to your study and research is not fair to you, Sarah, Jenna and most importantly my students. (Fred, email correspondence to researcher, 30 May)

It appeared that in the time Fred allocated for work, he was not able to make time available for PD; he prioritised his other working commitments over the PD, possibly perceiving these other duties to be of more importance than the PD. He had his own perception of his teaching abilities, possibly showing his unwillingness to explore whether his beliefs and values about teaching and learning are correct or even be collegial with the other faculty members.

Furthermore, implementing GCA lessons was perceived to be a timely process, with both teachers highlighting issues with setting up the equipment for their GCA lessons. The researcher's suggestions to set up the lesson beforehand was met with contemp due to the teachers' lack of time. Sarah replied,

> It is just not going to happen – end of story, point blank! I am not going to do it because I have limited time for recess and lunch, which half the time you end up tending to students and their needs and knocks at the door and phone calls. (Sarah, Teacher interview, 20th June 2014)

The researcher encouraged the teachers to "get the kids to do it while you were marking the roll" (Researcher, Teacher interview, 20th June 2014). However, Sarah explained that it would be too difficult to do this, noting, "They do not understand what you are asking for" and "I had to give that instruction half a dozen times because the markers were here, there or there. Again, this is just lack of understanding of the concept of the game of which way the court runs and all the rest of it" (Sarah, Teacher interview, 20th June 2014). The teachers appeared to be tied to the pedagogical approaches that had previously served them in their teaching practice and appeared inflexible in trying different organisation and management strategies to support the new pedagogical approach.

Whilst reflecting on the PD process in the evaluation phase, the teachers maintained that time as the main constraint throughout the PD process, highlighting issues around having to use free periods for the PD process and the impact this had on other areas of schoolwork and preparation. Sarah notes,

> Well, we were pressed for time trying to coordinate you and us at the same time. It was free period and when you only have one free period on Friday after you may have had five periods Thursday then you do not get stuff done necessarily that you need for Monday so that can be hard. (Sarah, Teacher interview, 20 June 2014)

Finding time to engage in the PD process or prioritising time for PD over the other aspects of the everyday activities of the classroom teacher proved to be challenging. The teachers appeared to prioritise other work commitments over their engagement with the activities as part of the PD process. However, it is possibly a lack of leadership and accountability for PD that is presenting a barrier here, not the perceived barrier of time. The findings here show that

there was no one driving the PD process, particularly in the absence of a Head Teacher, particularly when it came down to possibly engaging in PD activities outside of the prescribed school hours. It appeared that the teachers desire to build capacity was not necessarily matched by their actions. Issues in relation to accountability and collegiality both in the staffroom and the wider school community are also raised here. Consideration needs to be given to the value of PD, particularly in comparison to other aspects of teaching.

These findings raise important questions around the teachers' value of the professional learning and the time made available for PD. It was clear that the priority for the PD varied amongst the teachers with limited initiative or motivation driving the PD forward. Interestingly, the teachers only considered school hours to be the time available for PD. They did not consider time outside school hours as a viable option for their professional learning. Often even in the teachers' free periods, other tasks were prioritised over the planning and reflection tasks as part of the PD planning phase. They did not consider time outside of school hours, a time before or after school, as a possible opportunity for professional learning. Armour and Yelling (2004) report similar findings in their analysis of the career-long CPD of 85 experienced physical education (PE) teachers in England; they reported related issues with teachers' lack of time for PD and a dislike of giving up personal time to engage in CPD. Therefore, given these findings and those echoed in the literature, it can be concluded that teachers need to be given more time for PD. These findings have a direct impact on school and government provisions of PD, along with the level of accountability placed on teachers for their professional learning. Consideration needs to be given to the time available for PD, particularly if teachers are going to priorities their professional development over other work commitments. However, as Guskey and Yoon (2009) remind us, "simply providing more time for PD yields no benefit if that time is not used wisely" (p.497). PD must be valuable to the collective with a shared responsibility for improved practice and learning, to build their capacity and improve the outcomes of their teaching.

Accountability

With no head teacher or anyone leading the faculty, there appeared to be limited accountability for the teachers' current professional practice and their professional learning. During the planning phase the teachers revealed that they did not usually plan their lessons "…we don't tend to really have lesson plans" (Sarah, Teacher interview, 16 May 2014). The researcher notes, "there is no planning, no scope and sequence and no direction" (Researcher

reflections, 16th May). Reflecting on this limited accountability for planning within the PDHPE faculty, the researcher notes, "They have been getting away with doing very little work. They are not held accountable for their work; they have no Head Teacher. I question their motivation in providing quality units for the lower school" (Researcher, Reflection journal, 20 June 2014).

Sarah reinforces this limited accountability attributing the current teaching and learning culture within the faculty to the lack of Head Teacher, commenting,

> I think the reason it could be like that is because we do not have a Head Teacher going, 'what are you doing next', 'where are you going and all of that'. Everyone is just doing their own thing. I think that could have something to do with it. (Sarah, Teacher interview, 20 June 2014).

In another teacher interview, Sarah further highlights the implications of not having a head teacher, noting,

> Yeah. Because right now and the fact that we don't have a head teacher… Well it's like 'that's not our responsibility' but he [Barry] likes not having a head teacher because he can then say, 'But we don't have a head teacher, so no one told us that. (Sarah, Teacher Interview, 16th May 2014)

In the absence of a head teacher, Barry and Fred appeared to be influential over the teaching and learning culture within the faculty, Sarah noted "…so they can come in and go, 'this is how it's going to be' and everyone just has to go, 'Yes sir'" (Sarah, Teacher interview, 16 May 2014). It is possible that Barry and Fred's attitudes towards teaching and learning impacted on the teaching and learning culture within the faculty.

There was limited accountability for the teachers' professional learning or their teaching practice. The teachers were able to shirk responsibility, and the teaching and learning culture within the faculty was not driving self-improvement or a capacity to be innovative but doing the basic in an unstructured environment. There appeared to be a lack of collaboration and capacity building within the department and school overall for this group, who seem to exist outside of the school ethos.

This limited accountability within the faculty had implications during the planning phase of the PD. The teachers were unfamiliar with how to plan their lessons, the researcher notes, "they haven't got any idea how to plan and how to structure a lesson" (Researcher reflection, 14th May). Coupled with the increased content burden of GCAs, the teachers appeared a little overwhelmed with the level of planning required for GCA lessons. Sarah commented, Sarah notes, "there is a lot more to think about than originally presumed" and "I think what's quite eye-opening is seeing, I guess, how much thought really needs to go into it [lesson plan] to make sure you're getting out of the kids what you want to get out of them" and "it's [lesson planning] harder than I thought it was going to be", along with "Yeah it is a bit more detail than we ever really thought about. And I think for some of them [Barry and Fred] it's stuff they haven't heard about in years. (Sarah, Teacher interview, 16 May 2014).

This was also illustrated in the researcher's reflections:

> Jenna seems a little fazed with the amount of planning that we have to do. She was happy to just do the unit overview and then just go, she didn't really expect to have to do a detailed lesson plan and I don't think she was necessarily prepared. (Researcher Reflection Journal, 9th May 2014)

The challenge of planning created dilemmas in meeting the PD characteristics and the needs of developing skills in using a GCA, where the teachers required additional support in planning their GCA lessons. As such, much of the time during the collaborative planning phase was devoted to structuring the actual lesson, the researcher notes, "I spent a lot of time actually explaining the structure of the lesson and the lesson plan to her [Sarah]" (Researcher reflection journal, 9th May 2014). While the PD was offering personalised support, there was little support from the other faculty members, other than Sarah, who was inexperienced. As an experienced teacher, who usually didn't plan her lessons, Jenna was being taken back to being 'a beginner', having to plan detailed lesson plans, which was an uncomfortable position. Thus, along with accountability, a lack of coherence between the PD and the teachers existing beliefs and values about teaching and learning in Physical Education appeared to be an issue.

Difficulties surrounding subject matter knowledge further impacted the planning phase, where the teachers required further support in demonstrating GCA components in their lesson plans. Sarah comments, "I need more ideas as to how do it" and "I guess maybe, just a bit of

help to talk about ok well if this is the ideas that we want to get done, what's the best way to make that into a whole lesson?" (Sarah, Teacher interview, 1 May 2014). Jenna noted, that she needs a "better understanding of what needed to be in there [the lesson plan]. Like, I can't detail with detail things unless I know what I need to detail. Maybe just, how do I realise those specific things [elements of the lesson plan]. Like in my mind, I knew how I was going to communicate it [in practice], but I didn't put that down [in the lesson plan] because I didn't realise I could (Jenna, Teacher interview, 1 May 2014). The teachers also identified the need for more practice opportunity in both the planning and implementation of games-based lessons was also highlighted, "probably just a bit more practise" (Sarah, teacher interview, 16 May 2014), while the findings show a limitation with subject matter, they also show some nice reflection provided by the PD process. Although both teachers needed support in planning, their needs were different, requiring different input from the researcher, further highlighting the personalised nature of the PD. The findings here also stress the importance of knowing the starting point for PD, in this case, particularly around subject matter knowledge and the importance of this in tailoring the PD.

Research with in-service teachers by Light and Butler (2005) suggest that implementing the TGfU model requires more preparation and adaptability because the teachers must be knowledgeable about offensive and defensive strategies. Therefore, highlighting the increased planning demands as a result of the added level of knowledge and understanding. The teachers limited knowledge and understanding may have exasperated the planning demands here. As such, PD models aiming to improve teachers' capacity to implement GCAs need to consider this, particularly when the requirements to meet PD criteria go beyond what those receiving the PD expect they must do. The personalised nature of this PD tried to account for this level of preparation, whereby the support offered was tailored to the different needs in reaching the same outcome. However, in the case of Barry and Fred, this did not seem to be enough.

Scaffolding Strategies:

The findings throughout the PD process revealed a variety of scaffolding strategies to support teacher learning and build their capacity to implement GCAs. Observation of practice, the provision of specific resources and feedback, along with collaborative practice and active learning, were all identified as scaffolding strategies used to support and facilitate the teachers' implementation of GCAs throughout the PD process. These scaffolding strategies

were integrated as part of the PD process, tailoring the PD in subsequent phases to support the teachers learning and build their capacity to plan and implement GCAs. Scaffolding the teachers learning in this was allowed the PD to be personalised to the teachers' individual needs, ensuring coherence and making the PD both relevant and applicable to the teachers' needs.

Observing GCAs in practice allowed the teachers to identify a range of factors which served as motivating or facilitating agents in the PD process. These appeared to promote GCAs as a productive pedagogy, encouraging the teachers to persevere with the PD process and the implementation of the proposed pedagogy. Identifying familiar content knowledge as a starting point for learning was also proposed as a significant step in the PD process. The findings throughout the PD process reinforce the eight proposed PD characteristics as being key features in supporting teacher learning.

Observation of practice

In the initial phases of the PD process, the teachers wanted to see demonstrations of what GCAs looked like in practice. Barry commented that he needed to see "What is involved, what does a [GCA] lesson look like, I mean, I have got no idea what a lesson looks like" (Barry, Teacher interview, 20 March 2014). Similarly, Sarah commented, "I think the first thing will be observing a lesson. Having you run it [the lesson] so we can see ideally how it [game-based pedagogy] works" (Sarah, Teacher interview, 20 March 2014). Sarah suggested the demonstration lesson would allow the teachers to "see whether we do that well, what is that, how do we even do that, so we understand that, so it is not such a leap, I think that will be a starting point" (Sarah, Teacher interview, 20 March 2014). The teachers reinforced the importance of seeing what a lesson looked like in order to support the planning GCA lessons, helping them to "wrap our heads around what we need to eventually create lessons like. Ok, so we can plan it and then so each of us can actually understand what it looks like" (Sarah, Teacher interview, 28 March 2014). The teachers needed something concrete to see what GCAs looked like in practice. The importance of the collaboration between the teachers and the external expert, is highlighted here. Although possibly an interesting devolution of responsibility, the teachers were able to access the support they needed through this collaboration with the researcher.

Later in the planning phase (Phase B), Jenna reinforced how observing the researcher and "seeing what you did out there" (Jenna, Teacher interview, 1 May 2014) was beneficial, helping illustrate different modification strategies in games. She noted, "Thinking about just… grids and size of field and… scoring opportunities to make it big and small and in different parts so they just had to… we kind of applied those few things to the different games we were trying to sort out straight away using the knowledge that they've got" (Jenna, Teacher interview, 1 May 2014).

Identifying familiar content knowledge as a starting point for PD

The teachers identified the need to establish, "the sport or activity that will be involved or the focus of the lesson, maybe the aims and what you want the students to achieve" (Sarah, Teacher interview, 28 March 2014). Fred also stated, "Let's agree. For me it has been, lets pick which sport we want to play with and then pick the kids we want to use, put it together and right, let's just modify it around until it fits" (Teacher interview, 20th March). More specifically, Sarah identified:

> I guess we need to figure out what point we're starting from, so what is the first thing that we want to start with. Invasion? We'll do Invasion games? And then, so, where we want to start and where we want to end up and how we're going to get there.
>
> (Sarah, Teacher interview, 11 April 2014)

The teachers, along with the researcher decided they would plan a generic unit of work, and each teacher would then apply it to their preferred sport or the sport they felt they had the most content knowledge.

Researcher:	So, what I am hearing is that you want to see an invasion game. I sent you and invasion game lesson plan. You want to see an application in Touch or Soccer
Jenna:	Yeah because that applies to a lot of the things, we do here
Barry:	So, the unit will be called Invasion Games?
Researcher:	Well, we can do an invasion games unit, or we can do a Netball, Touch, Soccer unit?
Barry:	Is Netball not an invasion game?
Sarah:	It is!
Researcher:	Yep

Barry: Well that is what I am saying, so if we are programming it, it is just invasion games

Researcher: Yeah

Barry: And you can go out there and chose your approach

Researcher: Yeah, you can choose your application, or we can change the application. It is up to you how you do it, you might want to do it focused on soccer [Tim], you might want to do it focused on Netball [Jenna] I am just thinking in terms of your area of expertise so that you are in your comfort zone, so that might work. It was just that I sent you an example of a generic lesson plan, so you can see, and it can be applied to any of those sports. (Teacher interview, 28th March)

The teachers felt more confident designing and implementing a unit of work in an activity they felt knowledgeable and confident to teach. For Jenna, this was in Netball, Sarah in Soccer and for Fred, this was in Touch Football. They believed these sports to be more familiar to some of the students too, possibly supporting their leaning, "The kids although they play Soccer, there is a handful who understand the nature of the game and what you need to do and the rest of them are just bodies on the field" (Jenna, Teacher interview, 28 March 2014). Identifying familiar content knowledge as a starting point to scaffold learning was a vital step in the PD process, providing a key layer in the PD process. Selecting an activity where the teachers had better content knowledge allowed better focus to be placed on developing the pedagogical knowledge needed for GCAs.

Both Sarah and Jenna recognised the importance of establishing the learning goals for each lesson. Sarah notes, "Right, well and then if it's about tactical development, we'll need to come up with a focus for each lesson, so what we want to achieve in each lesson, and then how do we achieve that" (Teacher interview, 11 April 2014). Similarly, Jenna identifies the importance of establishing specific learning intentions or 'The goals of the day's lesson' (Jenna, Teacher interview, 28 March 2014).

In order for the PD to build knowledge and capacity, and support the teachers in their implementation of GCAs, it was important for the teachers to start from a position of knowledge, in this case, content knowledge in the form of a familiar sport. The findings show that having the content knowledge in a particular area would assist the teachers in

implementing GCAs since they were able to focus more on the pedagogical aspects of teaching using GCAs. The teachers believed this was also important for the students and having them be more knowledgeable around the activity would also support the teachers in implementing GCAs. These findings reinforce the necessity of the needs-assessment phase of the PD process and informs another layer in the PD model whereby the needs-assessment must identify the teachers' knowledge base as a starting point for the PD process. Moreover, at this early stage, the need for the PD process to be personalised and tailored to the individual teacher's needs are apparent. Each of the teachers required a different context for their GCAs to be implemented. At this stage, this involved different sports, albeit all in the invasion games category. However, it impacted on the nature of the lessons to be planned. Ensuring both teachers and students are engaged through the application of content, or in this case, the choice of activity may be an important component to engage teachers in the PD process.

Resources

While involved in the needs-assessment phase, the teachers fell back on more traditional approaches to PD, requesting the provision of resources in the form of textbooks, sample units and lesson plans to help build their knowledge and assist in illustrating GCAs in a more meaningful manner in order to support them in planning GCAs units and lessons. The teachers wanted resources to show them ideas of the activities to use and how to progress learning through each lesson. Barry states, "For me it is that progression, what does that 5-week program of touch football look like" (Teacher interview, 20 March 2014). The teachers requested, "send us something so we can read it and then try to implement it ourselves" (Barry, Teacher Interview, 20th March 2014) and "Could you bring in a lesson plan of a game centred approach lesson, so we can have a clearer idea of what a lesson looks like?" (Sarah, email correspondence, 24th March 2014). Similarly, Barry requested a unit overview, stating,

> I see a unit, broken down into weeks, broken down into lessons, broken down into technical bits, so I can go, ok so that is what it is. It gives us an idea of what the five lessons mean to the unit and having particular examples of questioning and that sort of stuff, like real basic. I want to see the unit overview and what goes into week one and what does week five look like in relation to week one.
>
> (Barry, Teacher interview, 20 March 2014)

The teachers had difficulties trying to picture what a GCA lesson would look like, reflecting their limited knowledge and understanding of GCAs. The amount they needed to know and do was perhaps a little overwhelming. The teachers believed that providing the resources in the form of teaching units would aid their perception of GCAs and possibly give some sense of scaffolding to what is new to them and very hard to perceive.

One of the concerns with learning is the balance between providing resources as a means of scaffolding learning and supporting the development of knowledge and understanding or the use of resources to be replicated without sufficient knowledge and understating. The researcher expressed concern about the capacity to which these basic resources would support the teachers' learning and understanding of GCAs:

> Researcher: Ok, so do you think maybe me just giving you that is going to help, would it be better to have us design that together?
>
> Barry: Well, we are starting from a place, well, I am starting from a place of ignorance, so if we are designing it together, I just see the time constraints with that to be. You know what I mean, like if we get, if you send us stuff and say, it looks like this... see how you go...
>
> Researcher: I am just very mindful of just giving you resources. How is that any different to what we can already do?
>
> (Teacher Interview 20 March 2014)

Barry's attitude towards the PD is interesting here, he does not know anything, yet appears to have done little to upskill himself in this area given the direction of the 2003 NSW PDHPE syllabus (NSW BOSTES, 2003), and the PD opportunities offered accompanying its release. These findings again highlight the lack of accountability for the teachers Professional Development.

In Coulter and Woods' (2012) study of Primary teachers' experience of a Physical Education Professional Development programme, they found that their developed resources were invaluable in supporting and enabling teaching, recommending PE PD providers "should consider the provision of appropriate resources that support teacher learning and enhance content knowledge" (Coulter & Woods, 2012, p.341). The resources developed by Coulter and Wood (2012) were designed to support teachers in terms of content and pedagogical approaches to be used. The teachers were briefed on the lessons so that they could use the

resources more flexibly. Given these findings and the teachers' requests for supporting material, a range of resources was provided to support learning. The teachers were provided with a chapter out of the Mitchell, Oslin and Griffin (2006) 'Teaching Sports Concepts and Skills: A Tactical Games Approach' textbook and sample lesson plans, outlining a tactical approach to teaching sport skills. The PL process required teachers to engage with the resource, where they were expected to familiarise themselves with the material, examine the content taught in the provided units and identify the structure of GCA lessons, the game forms used and the focus for learning in these lessons. Following this, the teachers were expected to discuss any questions, comments or issues that arose in the focus groups/interviews, as the researcher guided them through the resource.

Analysis of the unit overview showed that the teachers had utilised Mitchell, Oslin and Griffin's (2006) resource. Tactical problems (a) 'scoring - Maintaining possession of the ball and using space', (b) 'Preventing scoring - defending space, defending the goal, and winning the ball', and (c) 'Restarting play' were evident in the unit plan (Unit overview, 28th April 2014). It appeared that the PD had set the intention to implement the tactical games aspects through the planning process. However, the researcher recognised the potential limitations that the scaffolded example may have in practice, expressing her concern surrounding the teachers' capacity to implement these elements in practice. The researcher notes, "The Mitchell resource seemed to be really helpful, although I question how much they actually understand what they are doing" (Researcher reflections, 1st May 2014) and,

> I can see that Sarah has used the Mitchell resource. However, she is struggling with how to execute it in practice and because she has only drawn on it, she doesn't really have a deep understanding of what she is actually expected to do. She still struggles to see how games can be modified to suit the goal of the lesson or to set up a tactical problem for students or to make it easier or more difficult to achieve the aim.
>
> (Researcher reflection Journal 9 May 2014)

As part of the PD, the researcher had provided the scaffolded examples requested, and this had provided a beginning framework. However, there may have been challenges in the 'how' and 'why' aspect of implementing the pedagogy (why were the games selected, how would they be modified). There was also the possibility of over-trusting of the resource which would be expected with teachers new to an approach, based on Metzler's benchmarks.

Later in the evaluation phase of the PD process, Sarah commented on how helpful the provided resources were in supporting her unit planning during the planning phase. Sarah noted how she used the resource provided by the researcher to help plan the unit outline and subsequent lesson plan, "I looked at that thing that you gave us one of the tables, and it said you like, like attacking the ball, or scoring. So that's where I got those [Tactical Problems] from" (Sarah, Teacher interview, 1 May 2014). The resources were vital in scaffolding learning through this phase in the PD process. Both the resources and the demonstrations started to give the teachers a practical understanding of what GCAs looked like and provided some clarity and enabled some reference point for reflection.

These findings present a dilemma between the teachers current teaching practice and their beliefs about teaching and learning with the presiding focus on the technical aspect of performance, and the demands of the PD where the teachers are required to focus on game performance and building tactical awareness. However, unlike Barry and Fred, both Jenna and Sarah persevered with the PD to overcome this dilemma. There is an evident willingness from both Sarah and Jenna to experiment with game forms in lessons, indicating that they were engaged in the PD process. The dilemma between teachers beliefs and presiding pedagogical practice highlights an important issue for PD, where the PD process needs to challenge teachers' current beliefs about teaching and learning but also maintain their interest and commitment to change.

Collaboration

The needs-analysis demonstrated the value of collaboration both between the teachers and with the researcher as an 'expert' in the field. Collaboration with the researcher provided a form of scaffolding and support for the teachers learning. As a key feature of the PD model and the intentions of the planning phase (Phase B), both Jenna and Sarah supported the need to plan the GCA lessons collaboratively. Jenna commented, "you need to plan together, and you need to have the overview and the view of what you are going to do (Teacher interview, 28 March 2014). Similarly, Sarah comments "I see us sitting down and talking about where it starts and where it ends up and trying to figure out" (Sarah, Teacher interview 28 March 2014). Jenna also suggested that planning would be a collaborative process between the teachers and the researcher, suggesting "So you need to be there with us so there is not a time when we are all off. Wednesday there is a day where the 3 of us are off" (Jenna, Teacher

interview 28 March 2014). She identified organisation as a key agent in the collaborative planning process; she states, “Well you need to organise, you need to plan together, and you need to have the overview and the view of what you are going to do. I mean if you have zero organisation, you won’t be able to facilitate a successful lesson” (Jenna, Teacher interview, 28 March 2014).

In reflecting on the PD process, both Sarah and Jenna reinforced the benefits of the collaborative aspect of the PD during the planning phase noting, “talking it out loud going ‘yeah that makes sense’ or ‘how could we do that’?” (Sarah, Teacher interview, 1st May 2014) and “Yeah there was a lot of this going ‘hmmm’, just some quiet thinking and then what about throwing an idea out there and going ‘what about this’ , then sometimes we’d go and refer to the stuff you’d said and we’d go ‘ok, let’s have a look at that. Oh yeah, we seem to be on the right track’” (Jenna, Teacher interview, 1st May 2014). Sarah reinforced how beneficial collaboration with the researcher was in developing the unit of work, commenting, “You - being a resource and um, I think just also the like time like wrapping my head around it all I think has really made a difference” (Teacher interview, 16 May 2014). It was clear that Sarah and Jenna valued the collaborative planning process, a key feature of the PD and believed ‘having someone to do it with’ (Sarah, Teacher interview, 16 May 2014) facilitated better planning. The reflective practice as part of the PD process helped highlight this for the teachers.

The value of collaboration was echoed in the evaluation phase (Phase D) of the PD process, where Sarah noted how the PD had enhanced the collaboration between her and Jenna, noting, “I think it’s [The PD] been good. We’ve been able to really talk about what we’ve been doing and bounce off each other which has helped quite a lot in terms of ideas and planning and running our lessons” (Sarah, Teacher interview, 18 June 2014).

In the evaluation phase, both teachers highlighted collaboration with the researcher as an effective scaffolding strategy in supporting their learning and facilitating change to their practice as part of the PD process. Jenna notes “You sat down with us and you guided us, and we did things there. It’s not like you’ve left us - ‘this is what I need you to do’ - and then left. You saw us through the process” (Jenna, Teacher interview, 18 June 2014). Similarly, Sarah reinforced this stating “I feel like that process maybe… for me felt like there was more chance of it being successful than if it was just the two of us coming up with the stuff going:

‘We have no idea’” and “I think it’s made us easy, like better understanding and not just being left out in the cold” (Sarah, Teacher interview, 18 June 2014).

Moreover, the teachers appreciated the ‘active and progressive’ nature of the PD, commenting “I liked that it was hands on” (Sarah, Teacher interview, 18 June 2014) and “It was step by step. It made us understand exactly what it was about and how to do it and how to plan, how to implement, all that. I think that was very helpful” (Sarah, Teacher interview, 18 June 2014). It also appeared that the presence of the researcher added an extra level of accountability, “With you on our case it’s like, we have to do that, there is an expectation. This needs to be done and you just ... You do it” (Jenna, Teacher interview, 18 June 2014).

External and Knowledgeable expertise

Collaboration with the researcher as an external and knowledgeable expert proved to be a valuable source of support for the teachers throughout the PD process, Sarah notes, You - being a resource and um, I think just also the like time like wrapping my head around it all I think has really made a difference” (Teacher interview, 16 May 2014). Again, in the evaluation phase, both teachers highlighted collaboration with the researcher as an effective scaffolding strategy in supporting their learning and facilitating change to their practice as part of the PD process. Jenna notes “You sat down with us and you guided us, and we did things there. It’s not like you’ve left us - ‘this is what I need you to do’ - and then left. You saw us through the process” (Jenna, Teacher interview, 18 June 2014).

Similarly, Sarah reinforced this stating “I feel like that process maybe… for me felt like there was more chance of it being successful than if it was just the two of us coming up with the stuff going: ‘We have no idea’” and “I think it’s made us easy, like better understanding and not just being left out in the cold” (Sarah, Teacher interview, 18 June 2014). Collaboration with the researcher allowed for personalised support and ensured the success of the process. The implications of this were that the researcher had to be on hand an available when the teachers needed the support. The researcher needed to be able to provide observation lessons and resources relevant and applicable to the teachers’ needs.

Feedback

The teachers identified feedback as an essential component to support their learning in the planning phase. The teachers requested feedback on their unit and lesson plans to inform their future planning and support their implementation of GCAs. Sarah suggests, "maybe some feedback on it once we've gotten started?" (Sarah, Teacher interview, 1 May 2014). Similarly, Jenna reinforces this stating "maybe typed feedback that can be left with us, then we can find some time to look together" (Jenna, Teacher interview, 1 May 2014), acknowledging the collaborative nature of the planning process. It appeared that this feedback would help build their capacity to plan and implement GCAs, a critical element that needed to be integrated into the PD process. These findings also highlight the usefulness collaborative and active nature of the learning through the PD process.

The expectation during the unit planning phase was that the teachers would develop the entire unit of work and all subsequent lesson plans in the planning phase, before attempting to implement them in the implementation phase. However, during the planning process, the teachers requested feedback to be ongoing and given more frequently, every week, after they implemented each of their lesson plans. For example,

> Researcher: So, do you want to go lesson by lesson? So, each week we kind of plan a lesson ahead?
>
> Sarah: I think that's more realistic – just one at a time
>
> Researcher: I think that's probably good practice because then it allows us to kind of take into account
>
> Sarah: Yeah how much they've got done, how much they learned from that lesson
>
> Researcher: So, we've got our overview, but our lesson planning doesn't actually happen until we've taught the other one?
>
> (Teacher interview, 1 May 2014).

This need for regular, on-going feedback was also reflected in the researcher's reflections:

> I think the most interesting thing I took away here was the guidance that the planning and feedback needs to occur after each lesson rather than planning the whole unit in one go as I had originally thought. I think the guidance and direction from each lesson has been really valuable. Not only will it help the teachers take into consideration what has happened in the previous lesson, it will also help the unit be more students

> centred and allow progression as and when required based on what the students actually do in the lesson.
>
> (Researcher Refection Journal, 14th Mary 2014).

The feedback assisted with the reflective process at the end of each lesson. The PD was addressing the criteria outlined in the PD model. However, there were some conditions that needed to be considered when conducted in practice. Subsequently, the teachers used their unit overview to plan one lesson at a time rather than the entire unit. The researcher's ongoing feedback assisted the teachers' reflective practise and helped build their capacity, encouraging them to reflect after each lesson and allowing subsequent lesson plans to be informed by the teachers' reflections and researcher feedback from the previous lesson. This way, the teachers' learning could be supported or scaffolded through the implementation phase, and their learning could be focused on the benchmark elements not evident in the previous lesson. Subsequently, lesson planning, implementation and evaluation became a simultaneous and collaborative process. The findings here highlight the need for the PD provider, or in this case, the researcher to be actively reflecting on what the teachers are doing throughout the PD process, considering where they are currently at and where they are heading. The Action Research nature of the PD supported this process, unlike the more traditional models of PD where teachers attend a workshop, get given resources and are then left to implement their learning in their context.

In the evaluation phase, both teachers commented on how valuable the researcher's feedback was in supporting their learning through the PD process, Jenna notes, "Quick feedback, because without feedback it's useless and the feedback was a quick turnaround for it" (Jenna, Teacher interview, 18 June 2014). Sarah also noted how the researchers feedback supported her learning, "Things that, you know, I had a question that I just chucked in, and then we're getting feedback, sometimes a way forward. I think that was really good" (Sarah, Teacher interview, 18 June 2014).

Feedback was identified as a critical facilitator in supporting the teachers' reflective practice and building their capacity as part of the PD process. The personalised and situated nature of this PD revealed that regular feedback was a facilitating agent in the planning process, mainly where there are subject matter issues. The teachers were interested in reflecting on their lesson in order to support their future planning. The findings here demonstrate the importance

of reflective practice both for the teacher and the PD provider. It is necessary for the provider of PD to be actively reflecting on what the teachers are doing and where they are headed. This active reflection on the teachers needs is a fundamental difference between the PD model proposed here and more traditional forms of PD, presenting a big challenge for PD providers, who like to go in, deliver, provide some resources and then leave. Here the findings also challenge the PD research where it seems that this PD was meeting criteria set by researchers but presenting a range of 'provisos' that make following the prescribed recipe for effective PD not as simple as researchers suggest.

Chapter conclusion

This chapter synthesised the research findings into clear and distinct themes, showing how the data informed the PD process, allowing the PD to be tailored and adapted to address the teachers' individual needs. As the PD progressed, the teachers' needs become more refined, distinguishing differences between their needs and how the PD had to be designed to cater for the differing needs between the teachers. The findings highlighted the implications of prior experience and knowledge of GCAs on the teachers' capacity to plan, implement and assess using games-based pedagogy. The teaching and learning culture within the school and the teachers' established beliefs and attitudes about teaching and learning and how to achieve outcomes in Physical Education, influenced the success of the PD. Promisingly, the findings of this study showed the teachers improved capacity to implement GCAs throughout the PD process. The personalised nature of the PD revealed specific areas where the teachers needed further support to implement games-based pedagogy successfully. Some clear barriers to the PD process were revealed, including time and accountability, along with some scaffolding strategies identified by the teachers to support them through their planning, implementation and assessment of GCAs. These findings allowed for the overarching research questions 'What are PE teachers' experiences of and responses to a professional development model designed to support their implementation of GCAs?' to be addressed, along with the three secondary research questions to be explored. The discussion chapter will examine these findings concerning each of these secondary research questions.

Chapter 6

DISCUSSION OF FINDINGS

Introduction

This chapter will present a summary of the key findings and a discussion of how these findings relate to the study aim. Issues raised in this discussion are based on the data gathered across each of the four Professional Development (PD) phases (Phase A: Needs assessment, Phase B: Planning, Phase C: Implementation and Phase D: Evaluating), including email correspondence, teacher and expert interviews/discussions, teacher and researcher reflections, lesson observations and document analysis (unit plans, lesson plans, assessment tasks), as well as information identified within the Game Centred Approaches (GCAs) and PD literature. This chapter will draw on relevant literature to illustrate and support the conclusions drawn and reinforce any recommendations made to inform future practice and research. Informed by the literature and supported by the evidence from this study, the research questions are answered and an effective Professional Development model to support the implementation of GCAs is postulated. The issues and limitations of the study are examined in order to draw from the study implications for professional development strategies in the Physical Education (PE) context. In particular when implementing innovative pedagogies such as GCAs and how educational issues and the teaching and learning culture in schools can accommodate theory, particularly that of Professional Learning Communities (PLCs) and Communities of Practice (CoPs).

Background

This study provided an opportunity to examine the influence a conceptually designed PD model, based on the features and characteristics of effective PD, had on implementing an innovative, student-centred teaching approach, namely GCAs, in a school-based PE program. The aim of this research was to explore teacher learning and gain an insight into why teacher learning may or may not occur as a result of PD activity, specifically in the context of PE and implementing game-based pedagogy.

Informed by the literature, a PLC was established based on Stoll et al.'s (2006) fundamental constructs of effective PLC characteristic which included: shared values and vision,

collective responsibility, Reflective professional inquiry, collaboration, where group, as well as individual, learning is promoted.

The proposed model of PD incorporates eight critical features to professional learning drawn from the literature, including:

1. Knowledge building
2. Active learning
3. Coherence
4. Situated
5. Ongoing support
6. Collaborative practice
7. Capacity building
8. Reflective practice

The PD model proposed was school-based, on-site and ongoing, led by the researcher but guided and informed by the teachers' needs as part of the Action Research approach. Theories of CoPs and PLC were used to explore the effectiveness of the PLC. The research was situated in an NSW, Australian public High School. A qualitative approach to research was adopted for this study, using a Case study approach of the ongoing and cyclical AR process of planning, acting, observing and reflecting, to collect and concurrently analyse data continuously. Inductive analysis and constant comparison were used to analyse the data collected throughout each phase of the PD process. Through the data analysis process, several dominant themes emerged, where the findings from the data analysis were presented in about these.

The study was conducted with the following assumptions:

- GCAs are a productive and innovative pedagogy that provide teachers with a means of offering quality learning outcomes for their students.
- At present, there is an 'epistemological gap' (Light, 2008) or cognitive dissonance (Butler, 2006) between GCAs theory and teaching practice, where teachers fail to understand the research implications and struggle to implement GCAs in their teaching practice effectively.
- At its most effective, PD provides one possible solution for bridging this

'epistemological gap' (Light, 2008), translating the GCAs theory into practice.

- Current PD opportunities are inadequate and ineffective in supporting teachers to learn in ways that can enhance practice and facilitate and sustain change.
- PD is a complex process that needs to consider a wide range of contextual factors within the educational setting if it is to support and facilitate teacher learning.
- Actions Research within a Professional Learning Community provides an excellent platform to support and observe teacher professional learning, with the aim to change teaching practice.

What are Physical Education teachers' experiences of and responses to a professional development model designed to support their implementation of games-based pedagogy?

Contributing to the growing body of research that provides evidence that PD programs can have a positive impact on teacher learning and can extend and refine teaching practice (see: Armour & Yelling, 2007; Armour, Makopoulou, Chambers, 2012; Borko, 2004; Desimone, 2009; Desimone et al., 2002; Fishman et al., 2003; Garet et al., 2001; Guskey, 2002, Patton et al., 2013), the results of this study indicates that PD can have a positive influence on teachers' planning and implementation of GCAs. Though the model of PD posited had numerous positive and negative features that impacted teacher learning and engagement in the PD process, influencing teacher capacity to implement GCAs. In the case of Jenna and Sarah, the PD was effective in supporting their planning and implementation of GCAs and thus improved their capacity to implement games-based pedagogy. Sarah and Jenna's improved capacity to implement GCAs indicate that the PD model was appropriate for their needs and the context in which they worked. Conversely, in the case of Barry and Fred, they did not share the same success as Jenna and Sarah, failing to facilitate change to their practice and withdrawing from the study.

The findings of this study show that in order to support PE teachers to facilitate change to their teaching practice, in this case, by adopting games-based pedagogy, PD initiatives need to be personalised and contextualised to teachers' individual needs and setting. These findings are consistent with the PD research (see Guskey, 2002; Timperley et al., 2007) and studies specifically within a PE context (see Coulter & Wood, 2012). As with other key research conclusions in the PD field (see Atencio, Jess & Dewar, 2012; O'Sullivan, 2007;

Parker, Patton, & Tannehill, 2012; Patton & Griffin, 2008; Patton & Parker, 2014), sustained and ongoing support is necessary if teacher development efforts are to achieve substantive change to current PE. The findings of this study show how the teachers required ongoing support, particularly when implementing their lessons and translating the GCA theory into practice, this required a great deal of flexibility from the researcher as the PD provider. The teachers were actively engaged in the PD process, reflecting on practice and taking action to support their needs. This type of PD is in direct contrast to the traditional forms of PD offered, where teachers are engaged in one-off workshops, predominately off-site with limited follow up or sustained support (Casey, 2012a). These findings demand a radical shift in perspective of how PD is delivered and the teachers' role in the PD process, or more specifically, how teachers view themselves in the PD process. These findings echo those of Armour and Yelling (2004) who similarly call for radical changes to both the structure and content of PE-CPD if it is to impact upon the quality of teacher and pupil learning.

Conversely, in considering the withdrawal of Barry and Fred in this study, the findings show the potential for disengagement and withdrawal with PD initiatives, offering a stark reminder of the implications of PD and the possibilities of initiatives failing to achieve substantial and lasting change. Guskey (2002) recognises similar implications of PD, recognising that change is a gradual and often a complicated process for teachers, acknowledging that teachers are often reluctant to adopt new practices. As such, the barriers presented might offer some possibilities as to why PD initiatives may flounder. The results of this study reinforce the need for PD initiatives to ensure that teachers are change ready or plan for lack of change readiness or resistance to change. They also reinforce the importance of leadership of change.

The findings from this study, particularly in considering Barry and Fred, reinforce the importance of investment and buy-in from teachers in the PD process. The findings also suggest that in order to accommodate games-based pedagogy into practice, teachers require knowledge of the changes required, along with the skills to undertake the change, they also need knowledge of the processes of change itself. The PD literature supports the importance of 'buy-in', highlighting teachers' acceptance of PD initiatives as an important factor for successful change (Fullan, 2007; Guskey, 2002). Teacher buy-in to PD is linked with teachers beliefs and whether they believe change is necessary and their perceived capacity to implement new ideas associated with PD initiatives (Patton & Griffin, 2008; Kern & Graber,

2017). As such, Barry and Fred's belief and attitude impacted on their acceptance and involvement in the PD.

What facilitators and barriers impact on teacher professional learning when implementing Game Centred Approaches?

In order to promote positive change to PE teaching practice, it is necessary to understand the nature of facilitators and barriers within the PD process. Examining the facilitators and barriers that impact on teacher professional learning provides insight into why teacher learning may or may not occur as a result of PD activity, specifically in this case, in the context of PE and implementing game-based pedagogy. The teachers in this study identified a number of facilitators and barriers that impacted on their learning and thus the PD process when learning to plan and implement games-based pedagogy.

Facilitators

Through the course of the PD process, the teachers identified several scaffolding strategies that served to facilitate their learning and supported their design and implementation of GCA lessons. These are discussed here, along with other facilitating agents revealed through the findings.

Teaching experience

Like other studies, the findings of this study found that teaching experience was a facilitating factor in implementing GCAs. Jenna, the more experienced teacher, was more successful in implementing GCAs in practice, compared to Sarah, the newly qualified teacher. Rovegno (1998) posits that prior knowledge, capabilities and goals, teaching experience; and interactions with peers, are factors likely to influence changes in teachers' knowledge. Similarly, in Crux, Wai and Kam's (2012) study examining student teachers' learning to implement TGfU found students' teaching experience, preparation, class management, school facilities and support were major factors influencing the implementation of TGfU. In this study, Jenna's greater capacity to implement GCAs was particularly apparent in the implementation phase, where she appeared more able to translate the GCA theory into practice. Where Jenna was more adept with GCAs, Sarah required substantial support, particularly around the management of situated learning tasks and modifying and adapting games. A possible reason for this could have been due to her inexperience in teaching. Other

research reports that constructivist pedagogies such as GCAs are challenging and require teachers to possess a high level of PCK to implement them in practice effectively (Hastie & Curtner-Smith, 2006; Kirk, 2005; McCaughtry, Sofo, Rovegno, & Curtner-Smith, 2004; McNeill, Fry, Wright, Tan, Tan, & Schempp, 2004; Rovegno, 1998). It is likely that given Jenna's more extensive teaching experience that she had a higher level of PCK, equipping her with greater capacity to implement GCAs, or more able to focus on developing her capacity to implement games-based pedagogy since she had better proficiency in other teaching elements.

If PD is to be effective, it needs to take account of the varying experience of the teachers taking part in the initiative. In a PLC, as with this study, the teachers teaching experience may be wide and varied. The challenge, however, is to design PD to meet these needs and possibly use the teachers' expertise and experience within the PLC to support other members through the change process. This challenge is particularly the case for PLC, who work closely together to facilitate change to their teaching practice. As discussed later, when considering the barriers to PD, teaching experience is also coupled with entrenched beliefs about teaching and learning. These also need to be addressed if the PD is to be effective. The findings also have implications for Physical Education and Teacher Education, suggesting that teachers with limited teaching experience such as pre-service teachers or newly qualified teachers, like Sam, will need more extensive support from PD initiatives. More specifically, in this case, further support if they are to implement GCAs in their teaching practice.

External expertise

In Timperely, Wilson, Barrar and Fung's (2007) best evidence synthesis in professional learning and development, they state that all successful interventions involve expertise from someone external to the group of participating teachers. The researcher in this study provided the external expertise, having major input and interaction with the teachers throughout the entire PD process. Throughout the entire PD process, the researcher was on hand to collaboratively plan the teachers' lessons, observe their practice and provide reassurance and feedback to inform the next lesson. Collaboration with the researcher proved to be beneficial in supporting both Sarah and Jenna's learning. Both teachers reported the ongoing collaboration with the researcher as a valuable scaffolding strategy, supporting their learning and facilitating change to their practice as part of the PD process.

Before this study, the teachers had limited experience of GCAs, where their current teaching practice was aligned with more traditional pedagogies, which was clearly reflected in their beliefs and attitudes about student learning and how to achieve outcomes in Physical Education. Timperley (2008) suggests that "expertise external to the group of participating teachers is necessary to challenge existing assumptions and develop the kinds of new knowledge and skills associated with positive outcomes for students" (p.20). In the case of this study, the researcher played a key role in challenging the teachers' assumptions about learning in Physical Education, supporting them to understand new content, learn new skills, and think about their existing practice in new ways (Timperley, 2008). Both Jenna and Sarah were open and receptive to this new learning and made positive changes to their teaching practice as a result of the PD process. The findings showed how the engagement of external expertise, or in this case, the researcher, presented an increased level of accountability for the teachers' practice. Sarah and Jenna commented that the presence of the researcher, made them prioritise their GCA lessons over other activities that would usually take precedence. The researcher ensured the teachers capitalised on the learning in the time they had available.

These findings draw parallels to those of Armour and Yelling (2007), who consider the new role for CPD providers for effective PE-PD. Similarly, they highlight the continued need for external advice and expertise to support teachers' learning. Armour and Yelling (2007), findings heed caution for leaders or PD providers to tread a careful line when balancing the dual role as a leader and a follower within the PLC, where the teachers help identify and shape their learning needs. To this end, the findings of this study add to the body of research that shows that engagement of external expertise results in positive outcomes for learners, in this case facilitating the teachers in their planning and implementation of GCAs. In this case, it may be beneficial for schools to be linked to external experts within Universities and PD providers. However, the expertise may not have to come from external sources. It may be within the PLC itself or other faculties or schools nearby.

Demonstration lessons

Effective PD integrates theory and practice, where theories of curriculum, effective teaching, and assessment are developed simultaneously with their applications to practice (Timperley, 2008). In the case of this study, in order to effectively integrate theory and practice to support

learning, the teachers requested to observe GCAs in practice, requesting demonstration lessons from the researcher. The teachers believed that observing these demonstration lessons would help to bridge the gap between theory and practice, helping them see what games-based pedagogy looked like in practice. Observing the researcher deliver a GCA lesson helped demonstrate what change the teachers needed to make to their current practice in order to implement games-based pedagogy in their own practice. Observing practice was particularly important given the teachers' limited prior experience with GCAs. The situated nature of this PD allowed the researcher to take account of the teachers' needs and deliver multiple demonstration lessons with the teachers' own classes, contextualising the PD to the teachers own setting and demonstrating lessons based on the teachers' request of activity. Thus, the provision of demonstration lessons enabling the teachers to observe games-based pedagogy in practice served to facilitate their learning and support their implementation of GCAs.

Provision of resources

To accompany the demonstration lessons, the teachers requested the provision of quality, illustrative resources that would guide their practice through the planning phase. The teachers believed that coupled with the observations; these resources would better illustrate GCAs in practice and scaffold their planning and implementation of GCAs. Guided by Coulter and Woods' (2012) recommendations for effective PD to provide appropriate resources that support teacher learning and enhance content knowledge, the teachers were provided with sample lesson plans outlining a tactical approach to teaching sport skills from Mitchell, Oslin and Griffin (2006) 'Teaching Sports Concepts and Skills: A Tactical Games Approach'. The resources served to be beneficial in supporting the teachers through the planning phase. Sarah took the lead in planning the GCA unit, later acknowledging the resource as key in scaffolding her learning through the planning phase. However, given the teachers later difficulties implementing their designed lesson and translating theory into practice, it appeared that the researcher's reservations regarding the potential for the teachers to merely replicate the resource without sufficient knowledge and understanding to implement them in practice were not unfounded.

Timperely et al. (2007) of balancing theory and practice when providing resources, where the provision of support material such as the sample unit of work in this case, "may lead to a

change in teaching practice without a corresponding change in the teachers' understanding of their ability to apply the underlying principles in other situations" (p.79). As such, similar conclusions can be drawn with this study, suggesting the provision of such materials is not sufficient in itself to bring about changes in teacher practice. The teachers still needed help translating this theory to practice.

Using familiar content knowledge

Another scaffolding strategy identified by the teachers as a facilitating agent to their planning and implementing GCAs was the use of familiar content knowledge as a building block for their learning. Using familiar content knowledge to scaffold learning involved the teachers choosing to teach a unit of work in an activity they believed they possessed strong content knowledge. Timperley et al. (2007) advocate cueing prior knowledge in the learning process, suggesting it can help consolidate knowledge. Choosing a unit of work where the teachers had a strong content knowledge, and felt confident to teach, allowing the focus of their learning and the PD to be on the pedagogy. Rather than on both the content and the pedagogical knowledge, thus reducing the demands of the PD process. This scaffolding was particularly helpful given the teachers' limited prior experience with games-based pedagogy.

Feedback

Feedback is an essential component of PD and collaborative practice. The power of feedback has been extensively reported in the research (see Hattie & Timperley, 2007; Wisniewski, Zierer & Hattie, 2020). Hattie and Timperley (2007) claim that feedback is "one of the post powerful incidences on learning and achievement" (p .81). Effective feedback practices can greatly improve student learning and teaching quality (AITSL, Nd). The findings of this study would agree with this research. Both Sarah and Jenna identify the researcher's feedback as a vital scaffolding strategy, supporting their planning and implementation of GCAs. Coupled with the teachers' self-reflection of each lesson, the researcher's feedback helped inform their subsequent lessons and activity design. The students' positive feedback on the GCA lessons also presented as a facilitator of games-based pedagogy in this study. The teachers perceived there to be a range of valued outcomes for their students as a result of demonstration GCA lessons and their own GCA lessons.

Hattie and Timperley (2007) define feedback as "information provided by an agent regarding aspects of one's performance or understanding" (p. 81). In the case of this study, the researcher used her observational analysis using the benchmark elements to provide feedback, highlighting the areas of strength within the GCA lesson and areas of improvement specific to the GCA elements and their implementation. Feedback was also provided about quality teaching practice. For example, class management issues were considered and other issues regarding quality teaching. Written feedback was provided to the teachers once they had completed the PTRA and was then discussed with the teachers when they were planning their next lesson. This ensured that the teachers understood the feedback and could use this to inform their planning. The teachers also received anecdotal feedback from observing their student reactions to their lessons and chatting to them after class. Roussin and Zimmerman (2014) argue that school cultures that design professional learning that focus on sharing quality feedback build the capacity in their teachers to focus on proficiency and building powerful and reflective models of instruction. The findings of this study would agree with this considering the positive effect feedback had on supporting the teachers' implementation of GCAs. However, the learning culture of the school needs to be responsive to sharing practice, and teachers need to be open to giving and receiving feedback.

With consideration to these findings, PD opportunities need to scaffold teacher learning by providing teachers with relevant and applicable resources, demonstrations of practice along with the appropriate feedback and support to implement GCAs in practice. PD provision needs to build on teachers existing knowledge and provide opportunities to observe practice, where teachers can visualise what the theory looks like and make a connection between what is said and what needs to be done. This opportunity is particularly helpful if the practice can be contextualised to their own setting. These findings further demonstrate the personalised and contextualised nature of the PD and the flexibility required of the researcher when delivering the PD. Other facilitating factors are discussed later when considering the efficacy of the PD model posited. The findings reveal the PD characteristics deemed effective, along with the required components needed for establishing an effective PLC.

Barriers

In addition to these facilitators, a number of barriers were identified that impacted on the teachers' learning, impeded their implementation of GCAs and the PD process. For Jenna and

Sarah, these barriers presented roadblocks that they were able to navigate around in order to facilitate some change to their teaching practices. However, for Barry and Fred, these barriers presented too big a challenge to overcome, resulting in them both withdrawing from the study.

Learning culture

A strong culture for learning, where educators are committed to their own growth and development as professionals (Scarino & Liddicoat, 2009), is necessary for schools, if teachers' professional development is to be supported. Research suggests, establishing a strong professional learning culture is central to effective, high-quality teaching and fundamental to the schools' success (AITSL, 2012; Cole 2004, Scarino & Liddicoat, 2009; WestEd, 2000). Similarly, Day (2000), Law (1999) and Novick (1996) agree, suggesting school leaders who foster a collaborative learning culture support professional development. The Australian charter for the professional learning of teachers and school leaders (AITSL, 2012) states, "Professional learning will be most effective when it takes place within a culture where teachers and school leaders expect and are expected to be active learners, to reflect on, receive feedback on and improve their pedagogical practice, and by doing so to improve student outcomes" (p.3). Cole (2004) reinforces this stating "the objective of establishing a professional learning culture is to improve the effectiveness and consistency in teaching across the school" (p.9). He argues that a school without a strong professional learning culture is likely to foster a climate of complacency, professional incompetence and a poor commitment to improving student learning; where "teachers have little sense of common purpose and a limited concern for their own and their colleague's professional development" (p. 9).

The experiences of Jenna and Sarah in this study question the extent to which a strong professional learning culture was evident within the PDHPE Faculty or even the wider school community and raises the question, what do PD initiatives do if a strong learning culture does not exist? Within the PDHPE faculty, traditional pedagogy prevailed, despite its associated pitfalls and criticism. There appeared to be little planning and organisation of PE units and lesson plans and limited accountability or leadership within the faculty for the teachers' practice and their professional development. Sarah particularly felt unsupported in the PD process by both the faculty and the senior executive. As discussed late in this chapter, the teachers appeared to place little priority on their professional learning. The findings show how

Jenna and Sarah's continued commitment to the GCA-PD and the implementation of GCAs caused dissent within the faculty. Jenna and Sarah' perseverance with the PD culminated in a clear divide between Sarah and Jenna and Barry and Fred, the two teachers that withdrew from the study. The findings show that there was a breakdown in the collegiality within the faculty, providing an estranged and unsupportive environment. As such, it must be recognised that not all efforts for collaborative learning produce positive outcomes. It was difficult to detect a strong culture for learning within the school. This absence of a strong professional learning culture within the PDHPE faculty and possibly the wider school community, had a negative influence on Sarah and Jenna's learning, impacting on their participation in the PD process and limiting their capacity to make a change to their teaching practice.

It is proposed that the same barriers impacting on the teacher professional development in this study, also impede the development of a strong professional learning culture within the faculty and even the wider school community. As such, this study argues that a strong learning culture, that fosters the professional growth of staff was needed in this context, to supporting teachers' learning and their implementation of GCAs. In doing so, this study contributes to the growing body of literature that provides evidence that a culture of learning is crucial in facilitating teacher learning. Further research is needed in exploring how to foster and sustain a positive learning culture within the school community, one that nurtures the establishment of relationships, collegiality and encourages teachers to take risks, share practice and learning.

Limited knowledge and experience of GCAs

The findings revealed that the teachers had limited prior experience of GCAs, resulting in limited knowledge and understanding of games-based pedagogy. This limited experience and knowledge of GCA impacted on the teachers learning and impeded the PD process. It meant that the teachers were starting from a far more elementary position than initially anticipated. The teachers were limited in their capacity to plan GCA lessons since they did not understand what GCAs looked like in practice. In this case, the teachers "did not know what they did not know" (Researcher reflection, 30th April 2014). They did not know what change was required to their practice or what skills they needed to facilitate this change. These findings are consistent with those of many other GCA studies that show teachers struggle to conceptualise what GCAs look like in practice (see: Dudley & Baxter 2009, 2013; Randall, 2003; Robert, 2011; Rovegno, 1998).

As a consequence of this limited starting point for the teachers, the PD had to be further tailored and personalised to meet these needs, building the teachers knowledge and capacity to implement GCAs. In order to support the teachers' content knowledge, the teachers designed and implemented a unit of work in an activity area they felt confident and knowledgeable to teach. Focusing on an area they had knowledge and confidence to teach meant that the PD could focus on the pedagogy and the instructional practices required of GCAs. This meant that the researcher had to collaboratively plan a different unit of work and subsequent lessons for each teacher. These findings further illustrate the flexibility required in the PD process and the adaptability of the researcher as the PD provider. As the PD progressed, and the teachers moved to implement their planned lessons, the findings revealed gaps in the teachers' subject matter content knowledge, particularly for Sarah. Again, this impacted on their implementation of GCAs and the PD process. Sarah needed the PD to build her content knowledge around the tactical aspects of games, and then around the pedagogical aspects of GCAs, where games needed to be modified to highlight these tactical aspects. With limited subject matter content knowledge, the pedagogical aspects became more difficult.

Much of the GCA literature reports limited pedagogical content knowledge as a "stumbling block" (O' Leary, 2014) when learning to implement games-based pedagogy. Stran, Sinelnikov and Woodruff's (2012) report how the pre-service teachers' lack of pedagogical knowledge and pedagogical content knowledge on their study, distorted the implementation of Sport Education and TGfU. Similarly, Kuehl-Kitchen's (2005) attributed the lack of pedagogical content knowledge to the difficulties experienced by pre-service teachers when planning, implementing and assessing the TGfU model in their study. They suggest "Teachers need pedagogical content knowledge so that they can appropriately 'package' everything in order for the students to learn in the most productive manner" (Kuehl-Kitchen, 2005, p.126). Coulter and Woods (2012) study also revealed that Primary teachers' lack of content knowledge limited their ability to design their own lessons. It appeared that the teachers in this study faced the same hurdle. However, it is important to note that much of this literature studies pre-service teachers, whilst this study explored both a newly qualified teacher and three experienced teachers. The experienced teachers' limited exposure to GCAs was a surprise given games-based pedagogy being mandated in the NSW PDHPE syllabus. As such, it is possible that the teachers preference for more traditional pedagogical approaches reflected their limited knowledge and understanding of GCAs. This preference for more traditional pedagogies will

be discussed further in line with the teachers existing practice and beliefs about teaching and learning in Physical Education.

The findings of this study contribute to the calls in the literature that current forms of PE CPD need to enhance its capacity in developing teacher knowledge, both content and pedagogical knowledge (See: Armour, Makopoulou & Chambers, 2012; Bechtel & Sullivan, 2006; Casey, 2012). PE PD also needs to consider the sustentation and applications of knowledge to a range of different contexts, activities and settings.

Beliefs and attitudes about teaching and learning

The findings suggest that the teachers' prevailing pedagogical practice was aligned with their longstanding beliefs about teaching and learning in PE, or more specifically, how best to achieve outcomes when teaching games. Given the teachers' focus on the use of more traditional pedagogies, it is considered that their beliefs about how students learn in PE, was in juxtaposition with that of games-based pedagogy. These beliefs and values associated with more traditional pedagogy, thus present a possible barrier to the teachers' learning as part of the PD process. Timperley (2008) suggests that teachers "existing assumptions about curriculum or about what particular groups of students are able to learn can prevent teachers from examining how effective their own practice is in promoting student learning" (p.20). As such, the researcher was tasked with not only changing the teachers' practice, but she had to challenge the teachers' beliefs about how students learning in PE when playing games.

Most models of change consider a change in teaching practice, their beliefs and attitudes, and student learning, systematic to professional development (Desimone 2009, Guskey, 2002). Guskey's (2002) model of teacher change proposes that significant change in teachers' attitudes and beliefs occurs after they gain evidence of improvements in student learning as a result to the changes, they have implemented in their classroom practice. "The crucial point is that it is not the professional development per se, but the experience of successful implementation that changes teachers' attitudes and beliefs. They believe it [the new strategy] works because they have seen it work and that experience shapes their attitudes and beliefs" (Guskey, 2002 p. 383). In considering Jenna and Sarah, the findings of this study would support this model of change, since both Jenna and Sarah were motivated by the perceived benefits and valued outcomes for their student as a result of the GCA demonstration lessons,

and their initial implementation. The researcher was able to demonstrate results in terms of student learning outcomes and perceived benefits for the students, which gained buy-in from Jenna and Sarah. Thus, when the PD was combined with evidence of enhanced, valued outcomes for the students, the teachers' attitudes and beliefs started to change. Jenna and Sarah appeared to be more open and positive towards changing their beliefs and teaching practice, particularly when receiving feedback from the students regarding their learning and engagement.

In contrast, Barry and Fred appeared less open and somewhat resistant to changing their beliefs and teaching practice. These findings echo those of Kern and Graber (2018) who show that more experienced teachers are less open to change, particularly those closer to retirement. Although, unlike Fred in this study, Kern and Graber (2018) suggest that teachers teaching other subject were usually more responsive to pedagogical changes. Butler (1993) showed that teachers' core beliefs about why they teach, what they teach and how they teach it was the main predictor of change. In this study, it was clear that the proposed pedagogy did not align with how Barry and Fred believed PE should be taught. In Butler's (2005) work exploring how to encourage teachers to adopt Teaching Games for Understanding (TGfU), she reported that a large number of experienced teachers prefer traditional instruction approaches because they believe that TGfU may be opposed to their values, beliefs and attitudes toward teaching and learning. Barry and Fred appeared to prefer more traditional pedagogy and resisted the change of pedagogy required by the GCA PD. There appeared to be what Festinger (1957) coined 'cognitive dissonance' (Butler, 2006), where the actions of changing their pedagogical practice were incongruent with Barry and Fred's beliefs. It appeared that the gap or level of cognitive dissonance, between the teachers' current practice and beliefs, and that of the proposed games-based pedagogy was too big to get buy-in or motivation to engage in the PD from Barry and Fred. Timperly et al. (2007) suggest that, cognitive dissonance is not useful when trying to achieve implementation fidelity. Patton and Parker (2014) believe that changing teachers beliefs represents the most difficult and most substantial change possible, representing 'real' or 'deep level' changes (Sparkes, 1990). For Barry and Fred, it appeared that changing their beliefs would be too difficult to master in the course of this research.

These findings draw similar conclusions to those of Butler (2005), suggesting that teachers at all career stages can benefit from PD opportunities that encourage them to discuss and

challenge core beliefs and to examine how they translate their beliefs about teaching and learning into practice, and encourage them to experiment with approaches that align their practice and beliefs. It is the role of school leaders and external experts to challenge beliefs and values, presenting new ideas and pedagogies, and to ensure the focus of teaching practice is on students and their learning.

Time

The teachers perceived Time to be one of the main barriers in the PD process. This perceived barrier of time impacted on the teachers' learning and engagement in the PLC and impeded their implementation of GCAs. 'Lack of time' appeared to be the main barrier to the teachers' planning, implementation, reflection and assessment of their GCA practice, with the teachers claiming they did not have enough time to engage in the PLC and the required PD tasks such as unit and lesson planning, lesson set up or lesson reflection. The teachers expressed their concern about the amount of time the GCA-PD process required of them. They perceived the lesson preparation required in implementing GCAs to be a demanding and timely process, explaining it as 'a lot of work' or 'more work that they were used too'. The planning process appeared to be beyond their current scope of preparation for their typical PE lessons.

Wang and Ha (2009) report similar reservations regarding the amount of lesson preparation needed when implementing TGfU with the pre-service teachers in their study, suggesting that the effective use of time is a challenge for teachers when implementing TGfU. The teachers in Brooker et al.'s (2000) study of implementing a game sense approach to Teaching Junior High School Basketball also experienced issues with the amount of time spent on the planning process, deeming the amount of planning 'impractical in the modern teaching day' (p.17). Similarly, these findings are in line with the GCA research with in-service teachers by Light and Butler (2005), who report that implementing the TGfU model requires more preparation and adaptability because the teachers must be knowledgeable about offensive and defensive strategies. Díaz-cueto, Hernández-Álvarez and Castejón (2010) also reference the teachers lack time in the implementation of the lessons. Similarly, Casey and Dyson (2009) reported the time constraints associated with planning and delivering a hybrid TGfU–Cooperative Learning unit. The planning associated with GCA units and lessons is an elaborate and involved process. Equally, the time demands presented by planning and implementing GCAs may be amplified when teachers are new to games education,

particularly when their PCK is limited. As such, sufficient time needs to be allocated to the planning phase when planning to teach using GCAs.

The teachers in this study experienced particular difficulties finding time to collaborate the PLC during the planning process. Unable to find simultaneously scheduled free periods, the teachers claimed that the timetable restricted them from working collaboratively to plan their unit and subsequent lesson plans. However, even when they set aside time to work together, they were not able to fulfil their commitment due to other priorities that were considered more pressing. Similarly, they sometimes failed to complete their lesson reflection before conducting the next one in the unit, reporting that they did not have time to engage in the reflection activity. These concerns regarding the limited time available to teachers to engage in high-quality PD are lamented in the PD literature (see: Mayer, Mitchell, Macdonald, Land & Luke, 2003; Guskey & Yoon, 2009; Armour & Yelling, 2004; 2007, Hargreaves, 2012, Hoban, 2002, Newmann, 1994) with insufficient time identified as one of the most common constraints on professional learning in schools. Mayer et al. (2003) found that lack of time and opportunity for teachers to work together was a recurring problem in their 'Professional Standards for Teachers' pilot study. Likewise, Newmann (1994) describes time as a 'formidable obstacle' (p.2) to the development of clear, shared purpose, collective responsibility and collaboration when establishing a professional community within U.S. schools. Stoll et al. (2006) suggest that organisational structures such as time are essential to the success of PLCs, with the PLC research reporting similar challenges and limitations associated with time (East, 2015).

For Barry and Fred, time was perceived as such a barrier that they withdrew from the study, using the excuse that they did not have time to engage in the PD process. They attributed their 'lack of time' for the GCA-PD, to the pressures placed on them by other work priorities. Fred had been assigned extra Maths classes, adding extra pressure to his teaching schedule. Barry's time was preoccupied with his duties as Sports Organiser. Interestingly, the remaining teacher participants questioned the teachers' reasons for withdrawing from the study, suggesting it was possibly 'too much work' for them, particularly with planning lessons. The teachers explained that they did not believe that experienced teachers needed to plan lessons, and as such, they did not want to allocate time to this process. The ensuing discussion with Sarah and Jenna suggested that Barry and Fred were not interested in changing the way they teach. Barry was an experienced teacher; he was close to the end of his career, entering what Huberman (1993)

coined the ‘serenity and effective distance phase’, possibly believing that he did not need to change teaching from the way he had always taught. Initially, Fred was interested in games-based pedagogy and was happy to let Sarah teach his lessons and show him what she learnt through the PD process. However, he was unprepared to allocate time to the planning and reflecting activities required as part of the PD process. Even when presented with pre-planned lessons, he still refrained from being part of the study. Consequently, there appeared to be resentment from the withdrawing teachers towards the participating teachers for continuing with the PD and persevering with the implementation of GCAs in their teaching practice.

Prioritising time for professional learning

Interestingly, the teachers only considered the time available for their professional learning to be within the constraints of the school day. They did not consider time outside their timetabled hours as a possible opportunity for professional learning or collaboration. Lunch times did provide one opportunity to collaborate and complete PD activities. However, these were often disturbed and occupied with other administrative tasks. Often in the teachers’ free periods, other tasks were prioritised over their engagement with the activities as part of the PD process such as the required planning and reflection tasks. Even when they did allocate sufficient time to the planning process, they prioritised other tasks over the collaborative planning required as part of the PD process. Jenna frequently used her commitments as a Year coordinator or HSC teacher to explain why she had not had time to plan or reflect on her lessons. Barry and Fred’s commitments to their other duties were prioritised over engaging in the study. Contrastingly, Sarah appeared to prioritise time to be engaged in this PD process. However, this could possibly be the result of her having fewer work commitments and possible because she was temporary, striving to do everything she could to gain a permanent position at the school, allowing her to make this a priority. Armour and Yelling (2004) report similar findings in their analysis of the career-long CPD of 85 experienced physical education (PE) teachers in England; they reported related issues with teachers’ lack of time for PD and a dislike of giving up personal time to engage in CPD. Guskey and Yoon (2009) remind us, “simply providing more time for PD yields no benefit if that time is not used wisely” (p.497). The findings of this study raise important questions regarding the teachers’ prioritisation of time for their professional learning, considering whether they made their professional development a priority.

As Armour and Yelling (2007) suggest, it seems clear that the way forward for PD is to develop a model that reduces rather than increases the pressure of time. However, the findings of this

study advocate that teachers need to prioritise time for professional learning, to ensure a culture of learning is established and teachers are supported in their efforts for PD. Ramsey (2000) acknowledges that teachers do not have adequate structured time to work collaboratively with colleagues. He argues, "there is a need to view teacher education as being integrated into the careers of all teachers and educational leaders in a systematic, planned and developmental way" (p.38). Thus, in order for PD to be effective, it is clear that time must be well organised, carefully structured, purposefully directed, and focused on content or pedagogy or both (Birman et al. 2000; Garet et al. 2001; Guskey 1999). However, teachers must make a time commitment to professional learning. They need to invest their time in the PD process and hold themselves accountable to upholding this commitment. This study argues that in order to foster a strong professional learning culture within a school, time needs to be prioritised for teacher professional learning. Professional development opportunities need to be built into the teachers' daily work and schedule not tacked on to what they are already doing. Equally, teachers need to use the time provided to invest in their professional development.

As Gould (2008) indicates, teachers are often overburdened with various professional and personal commitments and obligations. Thus, time must be prioritised and allocated for teachers to talk, research, and plan. The teachers in this study often prioritised other professional and personal obligations over the PD and struggled to find time for their professional learning. As both Darling-Hammond (2005) and Gould, (2008) suggest, time needs to be prioritised and allocated for teacher professional learning, where time needs to be set aside for teachers to engage in the action research process if the professional development is to be effective. Time needs to be allocated and prioritised for learning. Whether this is time to participate in the AR process or to be actively involved in a PLC, teachers need there to be time to engage in collaborative and reflective activities.

What elements of games-based pedagogy do teachers need support with when learning to teach Game Centred Approaches?

The findings of this study presented a range of challenges for the teachers when implementing GCAs. These challenges arise in part due to the profound shift (Harvey & Light, 2015) in the role of the teacher from the director and controller of learning to facilitating and guiding it (see Butler, 2006). GCAs also require a considerable level of pedagogical skill (Light & Georgakis, 2005) and content knowledge within games. The teachers' difficulties with GCAs were particularly evident when implementing their lessons

and attempting to translate the GCA theory into practice. Sarah, the newly qualified teacher, required the most support when in implementing her lessons. Metzler's (2011) Benchmark elements helped pinpoint specific areas that the teachers required support, becoming a scaffold for directing focus in the PD process. The findings revealed that the teachers needed support implementing elements

1) Creating a tactical problem as the organising centre for learning tasks,
3) Teacher identifies needed tactical and skill areas from game form,
4) Teacher uses deductive questions to get students to solve the tactical problem, and
8) Assessment.

Sarah required significant support in modifying and adapting games. These elements of GCAS will be discussed here with the support of the literature.

Tactical elements of games

Harvey and Robertson (2017) suggest that the two benchmark elements that focus on the tactical components of games, element 1) Creating a tactical problem as the organising centre for learning tasks, and element 3) Teacher identifies needed tactical and skill areas from game form, are 'non- negotiable' teacher benchmarks when implementing GCAs. However, despite both Jenna and Sarah demonstrating these elements competently in their lesson planning, they encountered difficulties implementing them in practice when delivering their GCA lessons. Sarah experienced difficulties identifying the tactical and skill areas within the game. Sarah's difficulties identifying the tactical and skill components can mostly be attributed to the teachers' limited knowledge and understanding of GCAs. However, the findings here reveal gaps in the teachers' subject matter content knowledge of games which impacted on their implementation of the GCA lessons.

Addressing these elements in practice demands a high level of pedagogical content knowledge within games. The teacher is required to create a tactical problem, such as maintain possession of the ball or creating space in attack in order to score (Michell, Oslin & Griffin, 2006), as the focus for learning in a lesson. Learning activities are then designed so the problem can be solved through engaging in the lesson. Teachers need to be able to identify relevant tactical and skill areas within the game, in order to design relevant and meaningful learning activities to address the tactical problem, and support students in solving it. As such, teachers need to be able to observe these tactical and skill areas through student

performance in the learning activities. To do this, teachers must have knowledge of the 'fundamental' or 'primary rules' of the game, the "rules that supply the game with its essential character" (Gréhaigne, Richard & Griffin, 2005, p.4). In order to identify tactical knowledge or 'knowledge in action' (Gréhaigne, Richard & Griffin, 2005, p.50), the teacher needs to understand the 'Action rules' which provide an answer to the tactical problem, such as keeping the ball, playing in movement, exploiting and creating available space' (Gréhaigne, Richard & Griffin, 2005). Thus, designing meaningful learning experiences in GCAs is very demanding of the teachers' content knowledge, along with the added challenge of learning pedagogy to implement GCAs.

Given the teachers' limited exposure to GCAs and their focus on more tradition pedagogies that focus on developing technical ability, rather than tactical components, it is unsurprising that the teachers encountered difficulties implementing these elements in practice. Other research highlights similar difficulties around the tactical components of GCAs. For example. Barrett and Turner's (2000) study with an experienced PE teacher showed that whilst the teacher could competently teach technically correct skills; she found it problematic to observe and teach the tactical aspects of the game. The recently qualified teacher in O'Leary's (2014) study experienced the same difficulties as the teachers in this study. He found that the teachers often lacked a tactical focus in the initial game, which did not always set the scene for the development of tactical awareness and decision-making. Similarly, the teacher did not ask the students to solve a tactical problem.

The findings from this research study indicate that PE teachers may require more content knowledge of games, particularly around the tactical aspects of games and the inherent problems they create in games if they are to implement GCAs effectively. That is, if teachers are to develop the pedagogy associated with GCAs, they must first acquire the content knowledge of games. As such, developing this content knowledge needs to be the focus of any GCA-PD initiative. Teachers need to develop this knowledge and understanding of games with its application to situated learning activities in mind, so teachers can then learn to adapt and modify games to highlight the tactical aspects. The designing of relevant learning experiences to focus on the tactical problem cannot happen until the teachers' have developed content knowledge. As such, it may be beneficial to develop this content knowledge simultaneously with this pedagogy to support the teachers in translating the theory into practice. These suggestions echo those of McNeill, Fry, Wright et al. (2008); building GCA-

specific pedagogical content knowledge requires further attention if PD initiatives are to infiltrate practice.

Questioning strategies

Questioning is a 'key pedagogical tool' (Turner, 2005) and a 'pivotal instructional process' (McNeill et al., 2008) in implementing constructivist approaches such as GCAs. In GCAs, the reliance is on the teacher's questioning to stimulate thinking rather than direct instruction (Light and Georgakis, 2005); the teacher asks questions about what, where, and why and not just how (Light and Fawn, 2003, Kidman, 2005). As such, scaffolding learning through questioning is an important pedagogical tool for developing students' appreciation of how learning experiences link to the game (McNeil, 2008). Light (2014) suggests, the use of skilful questioning in GCAs empowers the learner to take responsibility for their own learning and supports them to learn how to learn. Harvey and Robertson (2017) also identify Metzler's (2011) element 'Teacher uses deductive questions to get students to solve the tactical problem' (Metzler, 2011, p.376) as a non-negotiable element when implementing GCAs.

The findings of this study show the difficulties the teachers encountered when using questioning strategies when planning and implementing their GCA lessons. Sarah and Jenna struggled to formulate and use relevant and appropriate deductive questions to facilitate learning and guide the students in solving the tactical problem set in their lessons. These findings were to be expected, given the teachers' difficulties surrounding the tactical aspects of GCA pedagogy. Sarah experienced difficulties identifying the opportune time to ask questions during the learning experience. She often left questioning until the end plenary session, bombarding the students with questions in a summary of their learning. Jenna's questioning and feedback were mostly technique focused and often failed to connect to the learning intentions of the lesson. Howarth (2005) suggests that teachers new to GCAs often lack the observational skills needed to develop questions in game-based lessons. This appeared to be the case for both Jenna and Sarah in this study where they struggled asking meaningful questions during the lesson and game-play. There was often little connection between the questions asked in the lesson and the learning intentions of the lesson.

Similar pedagogical dilemmas surrounding questioning are reported in the literature. Findings by McNeill et al. (2004, 2008) show that student teachers found questioning in GCAs

troublesome; mostly relying on knowledge-based recall or rhetorical questions, rather than the higher-order, tactical questions required when using game-based pedagogy. Similarly, the coaches in Roberts' (2011) study encountered difficulties with the use of questioning when implementing GCAs. As with the conclusions drawn by McNeill et al. (2008), the teachers' difficulties surrounding questioning strategies may be attributed to their limited content knowledge and prior experience of GCAs. As McNeill et al., (2008) suggest, the teachers needed to develop questioning techniques that promote deep thinking and are appropriately sequenced or layered during game-play as opposed to before and after.

Planning is vital in developing effective questioning and various phases of the lesson demand different styles of learning for maximum learning effect (Bailey, 2001). Germaine, Richard and Griffin (2005) suggest teachers may need to develop a questioning protocol like the 'debate of ideas' to support their use of questioning. There is evident criticism in the GCA literature regarding the dearth of resources to support teachers in their questioning in GCAs and the models of questioning provided in GCA resources and literature (Turner, 2005, Wright & Forrest, 2007). In their paper, Wright and Forrest (2007) challenge teachers to look beyond questioning where there is only one right answer, to shift the determination of correct and incorrect responses from lying solely with the teacher and set up questioning where the teachers are not the only one to ask questions. More recently, Harvey and his colleagues (Harvey & Light, 2016 and Harvey, Cope & Jones, 2016) have attempted to contribute to the scarcity of research in this area, providing a useful repertoire of resources to support teachers in developing questioning when teaching using GCAs. In recognising the difficulties teachers encounter with questioning in GCAs, Harvey and Light (2014) provide a range of other questioning protocols to support teachers to move beyond simplistic questioning, for example, the triadic Initiation, Response, Evaluation (IRE model of questioning (Cazden, 2001). They also advocate other questioning approaches for promoting deep thinking and dialogue, for example using 'skinny and fat questions' (Kagan, 2005), types of thinking and question starters (Kracl, 2012), a debate of ideas (Gréhaigne, Richard & Griffin, 2005), the GROW model (Gallwey, 1974) and the reflective toss (van Zee & Minstell, 1997).

Guided by this research, the researcher developed a range of questioning scaffolds to support the teachers in formulating questions in their lessons. These scaffolds appeared to support the teachers during the planning phase. However, they appeared less effective in supporting the teachers questioning in the implementation phase. McNeill et al. (2008) warn "designing and

pre-scripting questions to be situated in game-play is somewhat of an anathema" (p.243). Suggesting pre-scripting questions detracts from the student-centred nature of game-play. The challenges with pre-scripting questions was particularly evident in Jenna's lessons, where she needed to control the learning, often answering her own questions because she struggled to get the information she wanted out of the students.

The findings of this study suggest that teachers need to develop their knowledge and understanding of games and games teaching, to use questioning in their teaching practice effectively. The PD needs to focus on developing this knowledge and understanding before teachers can focus on their use of questioning strategies. PD initiatives in GCAs need to familiarise teachers with questioning strategies, with a focus on solving tactical problems. The use of scaffolding strategies is helpful; however, teachers need support using them in the lesson or setting up social learning activities where the students can use the questioning scaffolds within the lesson. The effective use of questioning requires teachers to get to grips with the teacher's role in guiding and facilitating their learning. They also need to be informed that their role is that of a learning guide rather than an instructor (Adams, 2006, O'Leary, 2014).

Authentic Assessment

Authentic assessment is a key feature of GCA lessons, mostly due to the shift in focus of teaching the tactical dimensions of game-play (Griffin, Oslin, & Mitchell, 1995; Mitchell, Griffin, & Oslin, 1995; Mitchell, Oslin, & Griffin, 1995). Teaching is "driven by the need for contextual, real-world, game-simulated practice to develop game knowledge and understanding (i.e. knowing what to do, and when and how to do it)" (Memmert, 2008, p. 220). Metzler (2011) suggests "student achievement represent a combination of knowing what to do and how to execute it correctly in game contexts" (p.377). As such, assessment needs to be situated within the context of the game and move beyond measuring technical performance, to assessing games performance.

This study highlighted the difficulties experienced by the teachers, particularly Jenna when conducting assessment in the practical setting. Before this study, the teachers rarely conducted assessment in a practical setting, and when they did, the assessment focused on skill drills and technical performance in full-sized games. This non-authentic assessment, which focuses on the technical product of student performance, is widely documented in the GCAs literature

(Oslin, 2005; Brown & Hopper, 2006, Gréhaigne, Richard & Griffin, 2005). Brown and Hopper (2006) state, "As PE teachers, too often we attempt to measure psychomotor competence in games units through skill tests, and we create contexts that mitigate against student success no matter how much effort they exert" (p.13).

Oslin, Mitchell and Griffin's (1998) Games Performance Assessment Instrument (GPAI) was introduced to the teachers, to provide a more authentic assessment opportunity. Pill (2008) advocates the GPAI as an example of authentic PE game assessment, suggesting it not only facilitates learning but also provides a tool to collect evidence of the learning that has occurred. However, the teachers struggled to implement the assessment in practice. The teachers difficulties with implementing assessment in practice may be due to her limited understanding of the GPAI but also her limited PCK associated with assessment in games. Until this study, neither teacher had conducted a peer assessment in the practical context, which may explain the number of management and organisational issues when conducting the GCA lesson. Memmert and Harvey (2008) suggest that researchers using the GPAI might look to increase their learning time on the GPAI. Similarly, in the context of this study, the teachers need to increase their familiarity not only with the GPAI but also with different forms of authentic assessment, that is, peer, self and teacher assessment. Interestingly, there also appears to be a dearth of literature on authentic assessment of skill development and tactical awareness (Harvey & Jarrett, 2013).

Modifying and adapting games

The roles of the teacher in GCAs shifts to being a designer and facilitator of learning, where they have to modify and adapt games to limit the technical demands to match that of the player (Evans, 2006; Light & Georgakis, 2005; Pill 2012; Stolz & Pill, 2012, Zuccolo, Spittle, Pill, 2014). The emphasis for learning is on game-related decision making (Kirk, 2009; Pill 2011). Tactical awareness is built through the exploration of the tactical problem whilst engaged in games that have been modified to allow the students to address the problem. The games are progressively made more challenging through various modification layers, to maximise student success and participation. For example, the rules, equipment, and playing area can be exaggerated to facilitate the opportunity for every player to address the tactical problem. Instead of modifying the game to provide skill practice, the skills are modified to provide practice with the tactical challenges of the game (Kuehl-Kitchen, 2005, p.23).

Sarah, the newly qualified teacher, needed further support around modifying and adapting games, whereas Jenna, the more experienced teacher, was more adept with managing the situated nature of games. However, she still required support aligning her modifications to the tactical focus for learning. Harvey (2007) suggests that knowing what modifications to make to the game and when to make them will depend on what the teacher observes during the lesson. The findings show how the teachers struggled to observe the tactical and skills areas through the students' performance in the learning activities, thus, impacting on their capacity to make relevant modifications to games to highlight the tactical problem.

Wang and Ha (2009) report similar findings in their study with pre-service teachers. They report the difficulties experienced in creating and modifying games to an appropriate level and difficulties with highlighting the learning intentions. Barriers relating to teachers' pedagogical difficulties are also echoed in the findings of Casey and Dyson (2009), who reported the pedagogical constraints associated with planning and delivering a hybrid TGfU–Cooperative Learning unit; Casey reports "I found that I had to rethink every lesson in an effort to develop student learning" (p.191). Similarly, Almond's (1986) earlier research found that some teachers felt out of their depth and unable to think up new ideas, when refocusing teaching away from skills and onto tactics. Chandler (1996) also notes concerns with GCAs, based upon teachers' deep knowledge of games, the development of appropriate game forms, transfer of games skills within categories and the development of appropriate procedures to do this. Similarly, these findings echo that of O'Leary's (2014) research and earlier research of Bunker and Thorpe (1986) that claim there is an over-reliance on technique-orientated practices. Like the findings in this study, O'Leary (2014) suggests that PE teachers need support in highlighting the tactical problem-solving nature of games. The conclusions drawn in this study are similar to that of Wang and Ha (2009). They recommended that PD initiatives need to focus on translating theory into practice. GCA PD needs to develop teachers pedagogical knowledge of GCAs, particularly the process of creating and modifying games, with the design of relevant and meaningful learning activities.

The complexity of Game Centred Approaches

The findings of this study raise issues with regards to the complexity of GCAs. The teachers encountered a range of pedagogical difficulties when trying to plan and implement a lesson that addresses all the benchmark elements. These difficulties have been attributed to the

teachers' limited knowledge and experience of GCAs whereby their dominant practice was aligned with more traditional, skill driven, linear pedagogy. Considering the teachers' difficulties in trying to authentically implement GCAs, addressing all eight of Metzler's (2011) benchmark elements, it could be suggested that GCAs are possibly too complex, particularly for teachers with limited prior knowledge and experience of constructivist pedagogy. These findings suggest that asking the teachers to demonstrate all benchmark elements from the onset of the PD might have been too demanding, particularly early in the PD process. Therefore, if PD is to penetrate practice and support the implementation of games-based pedagogy, then the complexity of GCAs needs to be reduced when learning to implement them. Harvey et al., (2016) agree four non-negotiable elements need to be implemented. However, it was three of these four elements that the teachers had difficulty implementing, suggesting these are the most complex elements and the most difficult aspects of GCAs to learn and implement.

In order to develop the teachers' PCK and support the teachers' implementation of GCAs in this study, the researcher had to reduce the complexity of GCAs. Rather than require the teachers to implement all eight benchmark elements in their entirety or as a holistic model; the researcher selected just one or two benchmark elements to focus the teachers' learning or learning goal each week. For example, Sarah spent two weeks focussing just on her questioning and using questioning strategies, whilst Jenna focused on setting a tactical focus in her lessons. Focusing learning around one or two benchmark elements allowed the teachers to refine their implementation, focus their reflection and experience some success in their delivery of GCAs. Once the teachers had experienced success in implementing the benchmark element, the learning focus was transferred to another element(s), until teachers were able to authentically implement the whole model in its entirety, demonstrating all benchmark elements.

Scaffolding the teachers' learning, the researcher reduced the complexity of GCAs and simplified the implementation by reducing the eight benchmark elements into more manageable chunks, selecting just one or two benchmark elements to focus on each lesson. Subsequently, the PD had to be specifically designed to support the individual teacher's area of need. The areas of improvement, as identified by the observational benchmark tool, became the individual focus for learning for each of the teachers through the PD process. Each teacher focused on one or two elements of GCAs to effectively implement it into their lessons, before progressing to the next element. As such, the researcher used 'scaffolding' (Wood, Bruner & Ross, 1976) to support the teachers' learning, focusing their learning on the specific elements

of GCA relevant to the individual teacher. In this way, the complexity of the model was reduced to align with the individual teacher's Zone of Proximal Teacher Development (ZPTD) (Vygotsky,1978), supporting the teachers' knowledge development and their implementation of GCAs. Through this 'scaffolded' learning process, the researcher was able to progressively improve the teachers' implementation of the benchmark elements by gradually building teacher knowledge and greater independence towards a more holistic and authentic implementation of GCAs.

Using the benchmark elements to identify a specific learning focus and then personalising the PD to develop knowledge and understanding of that specific element, provided a structure or framework for learning, making learning more manageable and the implementation of GCAs more achievable and as such, allowing the teachers to experience more success. Having a specific learning focus also allowed the researcher to focus on what could already be done and what support was needed. As such, the findings suggest that the complexity of GCAs needs to be reduced and that GCA-PD needs to identify specific areas to work on that align with the areas of pedagogical constraint and build towards holistic, authentic implementation. GCA-PD needs to scaffold learning by reducing the complexity of GCAs; focusing learning on one or two elements until the teacher has mastered that instructional process.

These findings offer a point of contrast from the GCA research that promotes the holistic and authentic implementation of games-based pedagogy. The literature expresses concern regarding watered-down versions of GCAs, suggesting that simplification of GCAs contributes to the misinterpretation and misunderstanding of games-based approaches that make them difficult to implement authentically (Jarrett & Harvey, 2014, Light & Evans, 2010, Roberts, 2001). Roberts (2001) warns of the over-simplification of a complex process when learning a new pedagogic approach, contributing to the misunderstanding of their true meaning. Similarly, Kirk (2011) raises caution with the extent to which the implementation of an approach such as a GCA can be modified and still legitimately be valid. Jarret and Harvey (2014) advocate that a true commitment to GCAs must be espoused by using its terms and also a practical understanding of it. However, this is the same literature that identifies the difficulties teachers and coaches have in implementing GCAs. Little insight is offered in relation to how to support the authentic implementation of game-based pedagogy. Perhaps these suggestions presented in this research presents some better insight into how to overcome these difficulties and support teachers in their implementation of GCAs. The findings of this study might move

a step closer in addressing the gap in the research, offering researchers and PD providers looking to support the implementation of GCAs need to understand that in order to implement GCAs authentically, then PD needs to firstly, break them down into its main components and build up to a more holistic implementation.

What are the characteristics of effective Game Centred Approach-PD?

The model of PD proposed in this study was grounded in the continuous action research cycle of planning, acting, observing and reflecting (Kemmis & McTaggart, 1988); engaging the teaches in the AR process through the four PD phases, Phase A: needs-assessment, Phase B: planning, Phase C: implementing and Phase D: evaluating. Establishing an effective PLC was central to the development of the PD model, along with the eight-core PD features deemed to be effective in supporting teacher learning. The PLC provided a platform for the AR, where all PLC members were expected to engage in the PD process. The effectiveness of the proposed PD model will be discussed through each of these features, AR as a PD framework, effective PD components and finally the efficacy of a PLC as a platform for teacher professional learning.

An Action Research framework for Professional Development

Like the trend in the educational literature, this study adopted an action research approach for the PD process. Action research can be "the most efficient and effective way to address the professional development of teachers" (Johnson, 2005, p. 44). In the case of this study, it provided the best method to explore the teachers' practice and connect the GCA theory to their own teaching practice, encouraging the teachers to become active learners and critically reflective practitioners. As such, the findings of this study helped explore the extent to which action research is an effective approach to teacher professional development. Given both Jenna and Sarah's increased capacity to effectively implement GCAs, this research would advocate the use of Action Research as a form of PD and a way to assist teachers to implement games-based pedagogy into their teaching practice, to improve student achievement. Furthermore, this study finds that an effective Professional Learning Community can serve as an effective platform for AR to support teachers to collaborate, share practice, exchange knowledge and understanding, and learn from each other as part of the AR process. However, the findings suggest the learning culture within the school community has a direct impact on the effectiveness of the AR and PLC thus, the PD

initiative.

A personalised approach to Professional Development

Just as teachers need to differentiate their teaching and learning to address the varying needs of their students, PD initiatives need to be personalised to accommodate the varying needs of teachers (Timperley, Wilson, Barrar & Fung, 2007). The findings of this study showed how the AR process allowed the PD to be tailored to the individual needs of the teachers, which proved to be vital in supporting them to transform their pedagogy and effectively implement GCAs. The disparity in teaching experience and a difference in knowledge and understanding between the teachers meant that their needs were quite different when learning to implement GCAs. Thus, the PD had to be differentiated and personalised to accommodate the teachers' individual needs. As the PD progressed, the teachers' needs changed, where the AR process informed the PD so provisions could be made to accommodate these needs.

A needs-assessment for Professional Development

The planning phase of the AR involved the teachers and the researcher establishing a plan for the PD and working out ways that the PD might best support implementing GCAs. Unlike more traditional forms of PD that offer a 'one-off', 'one-size fits all' approach, this included an initial needs assessment that identified the teachers beginning knowledge and understanding of GCAs as a baseline for their learning and a starting point for the PD. Given the teachers' limited prior experience and knowledge of GCAs and inability to see what it was they needed to support their implementation of GCAs, this initial needs-assessment proved crucial in identifying the individual needs of each teacher and a starting point for the PD. Subsequently, the research had to take a lead of the PD and direct the teachers learning. As the PD progressed, the teachers' needs changed and became more refined and individualised. The continuous nature of the AR process permitted an ongoing assessment of the teachers' needs, informing the PD process where the provision of PD was tailored and personalised to address the teachers' individual needs and facilitate their learning.

Acting and observing

The findings in the 'Acting' and 'Observing' AR phases, during the implementation phase of the PD, revealed that despite having planned their GCA lessons, the teacher required further

support translating the theory into practice. The findings in this implementation phase further revealed the disparity between the teachers, where Sarah, the less experienced teacher, required additional support, particularly with her management of situated learning tasks, such as questioning and modifying games. The situated and sustained support from the researcher, and the ongoing assessment of the teachers' needs as part of the AR process, allowed the researcher to respond accordingly and refine the PD to accommodate the teachers' needs. For example, the researcher was able to design a range of questioning scaffolds (see Appendix 22) to assist Sarah with their questioning strategies.

Reflective practice

The reflection phase of the AR process encouraged the teachers and the researcher to reflect on the effects of the teachers GCA implementation and the effects of the PD model for further planning and informed action. Jenna and Sarah were encouraged to critically reflect on their GCA implementation using the PTRA and used this reflection, along with the researcher's feedback to inform the planning and implementation of the next lesson. It is claimed that critical reflection can promote professional learning and facilitate change to teaching practice (Attard & Armour, 2006), enabling teachers to better understand and improve their practice (Grimmett, Mackinnon, Erickson & Riecken, 1990; Liston & Zeichner, 1990; Mayes, 2001; Shulman, 1992; Zeichner, 1994). The findings of this study give weight to these claims, where the teachers' reflective practice coupled with the researcher's feedback, was identified to be facilitating agent in the PD process. The findings show that the teachers greatly valued the feedback provided in this reflection phase and used it to plan subsequent lessons in the next PD cycle. Guskey (2002) suggests, "if the use of new practices is to be sustained and changes are to endure, the individuals involved need to receive regular feedback on the effects of their efforts" (p.387). The findings of this study reinforce this since reflecting on their practice allowed them to identify some valued outcomes for their students; along with the positive feedback received from their students in response to the GCA lesson, this proved to be a facilitating agent in the PD process. These findings are in line with Guskey's (1986) model of teacher change, where he proposes that teachers need to gain evidence of improvements in students learning if they are to change their attitudes and beliefs and teaching practice.

Similarly, Timperley (2008) suggests “Professional learning experiences that focus on the links between particular teaching activities and valued student outcomes are associated with positive impacts on those outcomes (P.8). Critically reflecting on the teachers’ lessons enabled areas of strength and areas that required further improvement and support to be identified. This, in turn, informed the next cycle of planning, in order to provide the support needed to build the teachers capacity to implement GCAs, further personalising and individualising the PD process. As the teachers’ knowledge and understanding of GCAs grew, their reflections became more refined, and the areas to improve practice became more specific.

Furthermore, this study support suggestions made by Makopoulou and Armour (2011) that, “further improvement in teaching quality requires a more “personalised and tailored approach to CPD” (pg. 586) and those charged with CPD provision “need to ground CPD design and implementation in a thorough analysis of individuals’ teachers’ needs and their learning dispositions at any given time” (pg. 586). The AR process, as part of this study enabled it to be personalised and tailored to the GCA-PD. By carrying out their individual action research allowed the teachers to play a key role in changing their teaching practice to benefit their students’ learning; they became of their own practice and their students learning. As such, the findings of this study would support AR as a PD process. Armour and Yelling (2007) suggest that PE teachers need to set their own PD agenda, based on their collaborative assessment of their pupils’ learning needs. However, the findings of this study suggest that an assessment of the teacher’s own needs is vital in designing PD to effectively support them in achieving positive change in order to address their students learning needs. Likewise, Patton and Parker (2014) support this suggestion reinforcing the importance of addressing teachers needs in PE PD before teachers can focus on other outcomes such as student learning. Moreover, Armour and Yelling (2007) identify the simultaneous role PD providers play in “being leaders (providing expert input, helping teachers to work together) and followers (supporting the specific learning needs of PLCs as identified by them” (p.195). Given the teachers evolving needs, the notion of sustained support and follow-up is also reinforced here.

These findings have implications for PD providers, who must take into consideration this assessment of teacher needs when designing and delivering PD provisions. They also have implications for the AR process, whereby the initial planning phase needs to set the foundations for the study. As such, more time might need to be spent in this initial planning

phase. Moreover, the individualised nature of this PD might suggest that there are multiple cycles of AR going on at the same time, to account for the disparity of needs between the teachers. The level of support in each phase of the PD process might be different depending on the teachers' needs. These findings call for an ongoing assessment of teachers needs and a flexible model of PD, whereby the PD provider responds to the evolving needs of the teachers. These findings also recognise the personal nature of PD provision. In this case, the PLC was small and catering for the individual needs was easily addressed by the researcher. However, this would be more difficult on a larger scale, where the needs are more diverse and varied. There must be flexibility from the PD provider.

Establishing an effective Professional Learning Community

Hawley and Rollie (2007) define Professional Learning Communities (PLCs) as communities committed to student learning and matters of teaching and learning. Research supports that effective PLCs can foster teacher learning, instructional improvement and higher student achievement (Borko, 2004), where schools are seen as appropriate and desirable contexts for teachers' professional learning (Kwakman, 2003; Stoll & Louis, 2007). Given this research, establishing an effective PLC was central to the PD model proposed in this study and provided the platform for the AR to be conducted. Guided by the research of Stoll et al. (2006), the five key features of a PLC, 'shared values and vision', 'collective responsibility', 'reflective professional inquiry', 'collaboration', where 'group, as well as individual, learning is promoted' were considered essential when establishing a PLC as part of this study. Accordingly, the PD process was then designed to provide a learning environment with all necessary characteristics required to support and sustain an effective PLC, for example, an authentic context, authentic activities, opportunity for collaboration, guided practice, scaffolding and opportunity for reflection.

The findings of this study show how conducting an effective PLC in this educational context was problematic, revealing the difficulties and challenges in establishing and sustaining a PLC as part of the PD process. The greatest challenges to PLCs in this educational setting included buy-in, accountability and time. Similarly, East (2015) in her study of PLCs in low-performing schools in West Virginia, reports time as the greatest barrier to PLCs. Drawing parallels with this study, additional barriers identified by East (2015) included accountability and negative attitudes/negative response to change. For Jenna and Sarah, the PD as part of

this study was effective in supporting them to facilitate change to their practice; they were actively engaged in the PLC and motivated by the potential to improve student outcomes as part of the PD process.

Conversely, Barry and Fred, were less willing to be engaged in the PD process, disengaged from the PLC and withdrew from the study without making any change to their teaching practice. Barry and Fred's disengagement with the PLC gave rise to two separate communities, where the continued engagement of Sarah and Jenna caused ongoing dissent and a divide within the faculty that impeded the PD process and the teachers' learning. These findings raise questions regarding the theoretical base for which the PD model was grounded, questioning the efficacy of PLCs to support learning in this context. Through this discussion, consideration is given as to whether PLCs are in fact, an effective mechanism for learning in this setting and thus a realistic expectation for professional learning in school contexts. The findings of this study suggest further research is required around establishing and sustaining effective PLCs, where it is recommended that PLC research needs to address what happens if these key elements are not evident or functional in PLCs.

Characteristics of an (in)effective Professional Learning Communities

Those researching and writing about the characteristics of PLCs assume that if the desired characteristics are present, these communities are 'effective' by being much closer to exemplary PLC practices (Cowan, Fleming, Thompson & Morrisey, 2004). By the same standard, in the case for Barry and Fred, if the PLC is ineffective or not successful in yielding change to teaching practice or enhancing outcomes for students, then it could be because these characteristics were not present or strongly established within the PLC. Snyder, Wenger and De Sousa Briggs (2003) suggest the effectiveness of a PLC depends on the strength of its domain and the sense in which members' identity with the given topic. The topic in the case being, facilitating change to teaching practice through adopting games-based pedagogy. As such, examining the capacity in which the teachers identified with this topic and the key components for establishing and maintaining a successful PLC (see, Stoll et al., 2006), provides a framework for examining the efficacy of the PLC in this study.

There is little research that reports on unsuccessful or ineffective PLCs. Thus, the findings of this study, in the case of Barry and Fred may shed some light on why PLCs fail and what to

do to support or recover PLCs that fail to achieve their desired outcomes or fall short in facilitating the desired change to practice or enhance student outcomes for all PLCs members. Analysis of such failings has the potential to inform and strengthen future PD initiatives using PLCs. The findings of this study suggest that the greatest challenge to PLCs is getting buy-in from teachers, sharing a vision and time.

Shared values and vision

Given the teachers' voluntary participation within this study, it was assumed that they all shared the vision to facilitate change to their teaching practice and were motivated and committed to engaging in the PLC and the PD process. However, the findings of this study show that this was not the case. Despite Barry and Fred's initial willingness and motivation to participate in the study, it appeared that they did not share in the vision to transform their teaching practice. Given the teachers' presiding focus on more traditional instruction, it is possible that Barry and Fred did not see the value in implementing games-based pedagogy. Nor did they see the capacity of GCAs to enhance educational outcomes for their students. The teachers claimed they had limited prior exposure to GCAs, thus did not know what was expected of them in facilitating change to their teaching practice and implementing GCAs. The more Barry and Fred learnt about what was expected of them as part of the PD process and gained a better understanding of the pedagogical requirements for teaching GCAs, the more they disengaged from the PLC. As such, it is possible that neither teacher identified with GCAs. They did not identify with need to change their teaching practice to align with more games-based and constructivist pedagogies. They were happy with the status quo, teaching the way they always had.

Sarah and Jenna's ongoing engagement within the PLC demonstrated their commitment to the PD and the PLC, in their case, the findings showed an improved capacity to implement GCAs. It was clear that Sarah and Jenna identified with the topic and the associated components of the PLC, where Jenna and Sarah were motivated by the perceived valuable outcomes for their students as a result of the GCA lessons, Barry and Fred were not. Sarah and Jenna perceived engaging in the PLC and the PD process to be "too much work" for Barry and Fred, or "more work than they were previously used too", contributing to their disengagement with the PLC and withdrawal from the study. The findings revealed several associated problems with the conduct of the PLC. The time demands placed on the teachers

to engage in collaborative and reflective practice was viewed as a negative aspect of being part of the PLC by all four teachers. With no head teacher or leadership within the faculty, there was no accountability for their teaching and learning or their engagement in the PLC. Consequently, there was no buy-in from Barry and Fred; there was no commitment or collective responsibility for learning, changing their practice or enhancing the educational outcomes for their students.

Members of a PLC are encouraged to be involved in the process of developing a shared vision; that vision is used as a guidepost in decision making about teaching and learning in the school (Hord, 1997). Similarly, CoPs theory suggests that participation in a CoPs is voluntary and essentially informal, where the negotiation of the 'domain of shared interest' is the result of a collective process and not determined by an 'outside mandate', by prescription, or by any individual participant (Wenger, 1998). Considering Barry and Fred's disengagement with the PLC, it is possible that they perceived the GCA-PD as an 'outside mandate' (Wenger, 1998) prescribed by the researcher or possibly the Principal, or even by Jenna and Sarah, given their continued engagement in the PD process, rather than viewing the GCA-PD as a shared pursuit for the benefit of their students. As such, there was limited buy-in from Barry and Fred. There was even resentment towards the remaining members of the PLC, resulting in them disengaging from the PLC and withdrawing from the study.

Collegial relationships

Webb, Vulliamy, Sarjac, Hämäläinenc and Poikonenc (2009) suggest that the relationships and emotions of the teachers are central to the atmosphere and stability of a PLC. Fawcett (1996) describes relationships between individuals as part of the PLC as caring and supported by open communication and trust. Similarly, Stoll et al., (2006) identify that mutual trust, respect and support among staff members are essential components of a PLC. Participating in the PD and engaging in the PLC as part of this study, affected the relationships between the teachers within the PLC. The findings exposed underlying issues with the relationships of the PLC members, where Sarah and Jenna felt unsupported and unable to communicate openly and freely. Feeling unsupported and the breakdown in collegial relationships impacted on the learning culture within the faculty and the effectiveness of the PLC. Jenna and Sarah's persistence with the PD and participation in the PLC caused division and dissent within the faculty, resulting in heated arguments and division with two separate communities, those

willing to engage in the PLC and those not, where Jenna and Sarah felt they could not share their practice as part of the PLC. It appeared that Barry and Fred resented the level of commitment and accountability placed on the teachers as a result of the PLC and the presence of the researcher. Engaging in the PLC caused a breakdown in the relationships within the faculty. The lack of engagement and leadership from the senior executive, also caused friction, where the teachers felt unsupported and discouraged. Rather than the PLC strengthening the bond between Principal and teachers and increasing their commitment to improvement efforts, the collegial relationships were fractured or perhaps the PLC just highlighted the limited collegiality within the school and the faculty, and exposed problems with the learning culture within the school.

Collective responsibility

In effective PLCs, it is expected that all members take collective responsibility for student learning (Stoll et al., 2006). Collective responsibility helps to sustain commitment, puts peer pressure and accountability on those who do not do their fair share, and eases isolation (Newmann & Wehlage, 1995, Stoll et al., 2006). However, the increased level of peer pressure and accountability as a result of engaging in the PLC in this study, appeared to contribute to the breakdown of relationships and caused division within the PLC. The findings show that there was minimal collective responsibility for engaging in the PD or for student learning. It is hoped that engaging in a PLC strengthens the bond between the Principal and teachers, increasing their commitment to improvement efforts. However, in the case of this study, it just exposed underlying issues with the learning culture within the school and the relationships between the PLC members, particularly with the Senior Executive. There was no accountability or collective responsibility for engaging in the PLCs.

Structural and cultural components of a PLC

In addition to the five essential characteristics of a PLC outlined by Stoll et al. (2006), Fullan (2007) identifies a number of structural and cultural components that are critical to the effectiveness of PLCs. These include “time to meet, physical proximity, interdependent teaching roles, communication structures, and teacher empowerment and school autonomy” (p.149), whilst cultural components such “openness to improvement, trust and respect, cognitive and skill base, supportive leadership, and socialization (of staff)” (p. 149). The findings of this study reveal a range of structural and cultural difficulties when conducting

the PLC, impacting on its effectiveness and success. The teachers reported that participating in the PLC and engaging with the PD activities was a demanding and time-consuming process, where they often prioritised other commitments over their professional learning. They perceived time as an ongoing and limiting barrier to their engagement with the PLC and participation in the PD process. They reported other shortcomings such as timetable constraints preventing collaborative and reflective practice. On commencement of the study, there appeared to a culture of team-teaching and sharing practice. However, further examination showed that this was instead, an opportunity to relieve the other teacher, rather than interdependent teaching roles. There were little communication and interaction between the faculty and the executive team, leaving Sarah and Jenna feeling unsupported and isolated within the school. The community was not robust, the learning culture was not supportive, and structures were not in place to facilitate learning and maintain the PLC.

Characteristics of effective Professional Development

The eight-core PD components embedded throughout the PD process were derived from a synthesis of the PD literature reporting the characteristics deemed essential for effective teacher learning. These included:

1. knowledge building,
2. active learning,
3. coherence,
4. situated,
5. Ongoing support,
6. collaborative practice,
7. capacity building,
8. reflective practice.

The findings of this study reinforce these characteristics as being essential components for effective PD, supporting and enhancing teacher learning. Although, additional elements including, leadership and accountability for learning, are also considered essential components that promote effective learning and need to be considered as essential components of any PD initiative.

Knowledge building

The PD literature suggests that, in order to build teachers' capacity, PD initiatives need to

focus on content and building teacher subject matter content. The findings of this study would agree with this research, although it would argue that there needs to be a focus on building pedagogical content knowledge, not just subject matter knowledge. As with Armour, Makopoulou and Chambers (2012), the teachers limited prior experience and knowledge and understanding associated with GCAs presented a barrier within the PD process. The teachers' initial knowledge and understanding of game-based pedagogy were limited to a few basic features of GCAs, impacting on their ability to identify what they needed in order to support them through the PD process. The findings exposed gaps in the teachers' subject matter content knowledge of games, as well as their pedagogical knowledge associated with games-based pedagogy. In particular, the findings show how the teachers struggled to deliver their planned GCA lesson in practice during the implementation phase. The teachers needed ongoing support translating the GCA theory into practice. These finding support those of Rovegno and Bandhauer (1997), showing that possessing appropriate content knowledge is essential in implementing and supporting change adequately.

Identifying the teachers' knowledge base as a starting point for PD was an essential building block in the PD process. Selecting an area, the teachers had established content knowledge, for example, a sport the teachers were familiar with, as a base for their learning allowed the researcher to focus more on developing the teachers' pedagogical knowledge and translating the theory into practice. In order to build knowledge, the teachers were provided with resources and demonstration lessons to supplement their knowledge. This was in addition to the ongoing support and external expertise of the researcher. Unlike the criticism of current 'homogenous' approaches to CPD that 'deliver packages of standardised knowledge' (Casey, 2012) this model of PD offered a personalised and tailored approach to build the teachers knowledge. The teachers were actively involved in the PD process through collaboration and reflection, which proved to be important conditions for knowledge building to occur in the PLC. As the PD progressed, the teachers' capacity to effectively implement GCA lessons increased, suggesting the PD model was effective in building the teachers' knowledge associated with GCAs. The previous discussion in this chapter has advocated for the simultaneous development of both content knowledge and pedagogical knowledge, giving the teachers context for their learning and supporting their application and translation of the theory into practice. The findings here reinforce the need for PD initiatives to ensure a deep understanding of pedagogical content knowledge, to support and sustain the teachers' implementation of the pedagogy and to ensure the transfer of this knowledge to a different

sport or activity area. Similar conclusions are drawn by Coulter and Woods (2015), who argue that PE-PD should focus on depth of content and pedagogical content knowledge rather than breadth.

Capacity building

In this study, the conception of success was depicted in the teachers' increased capacity to implement GCAs effectively. The findings showed that as the PD progressed, the teachers' capacity to implement GCAs effectively increased, suggesting that the PD process was effective in building teacher capacity. The PD literature suggests that in order to build teacher capacity, teachers need to start viewing themselves as learners (Armour 2010; Makopoulou & Armour 2011a, 2011b, Patton & Parker, 2014, Patton, Parker & Pratt, 2013). However, transforming teachers from passive to active, independent learners is challenging and requires a lot of 'capacity building' work (Tripp, 2004). The collaborative and hands-on nature of the PD process helped to transform the teachers into active learners. The ongoing process of planning, acting, observing and reflecting made the teachers part of the learning process. As the PD progressed and the teachers' knowledge and understanding of GCAs grew, they were better able to identify what they needed to support their implementation of GCAs and refine their teaching practice. The teachers needed a deeper knowledge and understanding of GCAs and games, for their capacity to be built. As such, the role of prior knowledge and the active and social nature of learning can be associated with teacher capacity building. Given these findings, it is possible to suggest that the PD model posited in this study had the ability to build teacher capacity. As such, this study would advocate that both AR and establishing an effective PLC plays a critical role in building teacher capacity. These findings support Stoll et al. (2006) and advocate PLCs as being appropriate platforms for building teacher capacity and sustain teacher improvement.

In their work with PLCs, Stoll et al. (2006) suggest that capacity is a "complex blend of motivation, skill, positive learning, organisational conditions and culture, and infrastructure of support" (p.221). This study would support this suggestion, reinforcing that the professional learning culture and infrastructure support within the whole school community needs to be in place and provide strong leadership, if teacher capacity is to be built and change sustained. Despite the teachers' capacity to implement GCAs being built as a result of the PD process, the extent to which the teachers were empowered by the process and had

complete autonomy or control and initiation over their learning could have been further developed. This autonomy might have been possible with more prolonged engagement in the PD, and a more supportive teaching and learning culture with strong leadership within the faculty and wider school community. Despite Sarah's limited teaching experience and temporary position within the faculty, she emerged as a leader in the PD process, driving the teachers learning forward. The PD process had built her confidence and capacity to lead their professional learning. However, her capacity in this role was limited. There needed to be greater leadership and support from within the faculty and whole school community. As such, PD initiatives need to focus on this learning culture in schools, to increase leadership for learning and empower teachers to take control and initiation of their learning.

Situated and active learning

True to the constructs of situated and constructivist learning theories, and consistent with the notions of AR and 'teaching and inquiry', the findings of this study showed that the teachers greatly valued the contextualised and personalised nature of the PD, crediting the 'hands on' and guided 'step by step' nature of the PD as key facilitators in their learning. The teachers felt their learning was more successful when working directly with the researcher in their own working environment. Cochran et al. (1993) draw similar conclusions in their study, stating "live teaching permits the direct interaction that shows ideas in use and opens the way to negotiating paths of understanding" (p. 267). In support of this, Coulter and Woods (2012) argue that PE-PDP facilitators need to be onsite to experience and understand the learning culture teachers are part of, in order to be able to suggest ways to facilitate change. Due to the situated nature of the PD, the researcher was able to embed herself within the social context and the PD process, becoming part of the 'team' and getting to know the teachers, their needs and their strengths. Being embedded in the school context and the research process allowed the PD to be tailored individually for each of the teachers and personalised support to be provided. The PD offered was more authentic, since it was using the teachers' own classes and teaching environment. The research was also able to identify first-hand the barriers to learning and work with the teachers to overcome them.

The findings of this study suggest that GCA-PD needs to take place within the teachers' context of learning. The strength of the PD process in this study was that the learning was embedded into the teachers learning environment, the PD provider was situated within the

school and all PD activities took place within the teachers' school and were integrated into their practice, using their students and resources. Being situated within the school allowed the researcher to gain an understanding of the individual teachers, their backgrounds, their needs and the environment they were learning and teaching in. It allowed the teachers to apply what was being taught to their lessons and even watch the researcher deliver the lesson with their own classes. The teachers were guided through their planning, implementation, assessment and reflection. The findings reported that teachers felt their learning was more successful when working directly with the researcher in their own working environment. It made the learning relevant, meaningful, applicable and transferable.

As Cole (2004) states, the most authentic place for teacher learning is the school, arguing "professional learning is enhanced when the learning takes place in context and improves one's micro and specific teaching skills rather than one's generic teaching skills" (p. 7). The situated nature of the PD allowed the researcher to continuously reassess the teachers' needs and personalise the PD accordingly. It also allowed the researcher to experience the environment the teachers were learning in and identify the culture for learning within the faculty and wider school context. The situated nature of the PD in this study also provided a means to support the teachers with the barriers they identified to their professional learning. Having the researcher available at the school provided a source of support and reference, it also provided a level of accountability that was missing within the faculty. These findings also draw parallels with the CPD research highlighting the importance of teachers being given the opportunity for 'active learning' (See Garet et al., 2001; Desimone, 2009 & Armour & Yelling, 2004). The PD presented was relevant and applicable to the teachers and their students. It gave them specific ideas and practices to use in their context with their students. It allowed for the confinements and restrictions of their teaching and learning context.

This proposed PD is very different from the one-day, off-site PD, which presents minimal follow up to support participants to integrate their learning into practice, that is typically offered to teachers. Cochran et al. (1993) draw similar conclusions in their study, stating "live teaching permits the direct interaction that shows ideas in use and opens the way to negotiating paths of understanding" (p. 267). In support of this, Coulter and Woods (2012) argue that PE-PDP facilitators need to be onsite to experience and understand the learning culture teachers are part of, in order to be able to suggest ways to facilitate change. As such, this study argues that if GCA-PD is to be effective in supporting teachers to implement

GCAs, then professional learning activities need to take place in the teachers' context, the PD process needs to be embedded into the teachers teaching and learning environment and integrated into their teaching practice.

Collaborative practice

Collaborative practice was an essential component of the PD model, along with being a key feature in establishing an effective PLC. As with the findings from the literature (see Borko, 2004; Desimone, 2003; Desimone, 2009, Sjoer & Meirink, 2016), both Jenna and Sarah valued the collaborative nature of the PD, particularly with the researcher, viewing it as a facilitator in the PD process. However, finding time to collaborate, particularly in the planning phase proved difficult. The pressure to collaboratively plan and share responsibility for developing the unit of work and subsequent lesson plans added to the teachers' time demands and already overburdened schedules, to such an extent, it caused Fred and Barry to withdraw from the study. In the context of primary PE, Duncombe and Armour (2005) argued that collaborative professional learning might not be effective, given most teachers are not knowledgeable enough about the subject to share learning with professional colleagues, even after specialist input. Similar conclusions could be drawn here with Barry and Fred, since they had very little knowledge and understanding of GCAs, possibly impacting on their capacity and willingness to collaborate with the PLC.

Moreover, the findings disputed the teachers' prioritisation of time, questioning the value they placed on this collaborative practice and the PD. As such, it is argued that time for collaboration and reflection needs to be prioritised if teacher learning is to be supported; the teaching and learning culture within the school needs to promote a collaborative culture of teamwork, allowing time for collaborative and shared practice. Although at an individual level, teachers need to be motivated and take responsibility and initiative to engage in collaborative practice with their colleagues. As with the findings from Armour and Yelling (2004), teachers must be given the opportunity to exchange knowledge and experience, sharing ideas and practices with fellow professional, reinforcing the need for the teaching and learning culture within the school to value this sort of professional practice and learning. As such, the findings of this study reinforce those of Nash (2009) advocating that collaboration, and collective participation are critical features for teacher learning. Teachers need to see the value in this collaborative practice to support their learning and improve their practice.

The findings of this study would also suggest that collaboration with an external body, someone or a group of people with external expertise was particularly beneficial in supporting teacher learning. The researcher provided this external expertise in this study. However, this external expertise could be linked with other schools who have expertise in a given area, or similar to the researcher in this study, it could be to Universities. These external experts need to be closely linked to the PLCs, sharing practice and invested in the teachers learning and the learning culture within the school.

Reflective practice

As previously discussed, when exploring the AR framework, reflective practice is essential in improving teaching practice and needs to be a core feature of any PD initiative in schools. The findings of this study show how reflection on practice allowed the teachers to see benefits for their students, motivating them to persist with the PD process. It also helped identify areas of need to redirect and tailor the PD to refine the teachers' practice. Reflective practice ensured the teachers were actively engaged in their learning, although they needed considerable guidance in the beginning from the researcher. Like the barriers with collaborative practice, the teachers often cited time as a barrier to reflective practice, preventing them from filling in the reflection sheet after the lesson. Often the researcher's feedback was used to guide the teachers' reflection and inform the planning for the next phase.

As Brown (2011) suggests, reflective practice needs to be done in an informed way, the teachers needed structure and guidance for their reflection, particularly given their limited initial knowledge and understanding of GCAs. The teachers needed to be taught how to reflect on their GCA lessons. The PTRA provided for reflection offered some structure. However, the researcher found providing the teachers with feedback and the observational analysis using the benchmark elements helped better guide their reflection and provided a clearer structure for the feedback and planning sessions. As highlighted when considering collaborative practice, the findings of this study reinforce the need for reflective practice to prioritised. If teachers are to improve their practice, time is needed to reflect on their practice, their lessons and their units of work. Reflection needs to be built into the teachers' busy schedules. This study would also advocate for the reflection to be a collaborative process, so

the teachers can share their practise, discuss strengths and weaknesses, in order to inform future practice.

Ongoing support

Despite the consensus that PD should be continuous and ongoing, involving follow-up and support for further learning (Armour & Yelling, 2004), little is known about the optimal duration of PD initiatives. Desimone (2009) presents a guide of 20 hours or activities spread over a semester, whilst Garet et al. (2001) suggests there needs to be adequate time to allow for discussion about practice and opportunities to try out new approaches with opportunity for feedback on the practice. Given this research the PD as part of this study, engaged the teachers in a continuous process of planning, implementing and reflecting, where the researcher was able to provide ongoing support and assistance to the teachers when they needed it, for the duration of the unit. The continuous and contextualised nature of the PD process permitted the PD to be continuously adjusted, to address the developing needs of the teachers. This flexibility and tailored approach proved to be beneficial in supporting the teachers learning and building their capacity to implement GCAs effectively. However, finding time to engage in the PD process was difficult, where personal and other work demands were often prioritised over the PD activities. The teachers often presented time as a barrier preventing them from engaging in the PD process. They found the PD process and teaching using games-based pedagogy to be a lengthy and time-demanding process, or perhaps, more work than they were used to. Consequently, the initially anticipated 10-week unit of work was shortened, with lessons lost to other school activities that were considered a priority. This shorter time-frame impacted on the PD process and the teachers' learning.

The PD demanded great flexibility of the researcher and the researcher's time, where the researcher needed to be able to organise the PD around the teachers' time demands and availability. More time was needed for collaboration, particularly in the planning and reflection phase. As such, the findings of this study would advise that if the PD was to penetrate practice, then the support of the researcher needed to be prolonged, and the PD needed to be extended, covering another teaching unit and activity area. The PD process needed to be sustained over a greater time period. As many others have suggested before, change is a demanding and length process. Much of the PD literature acknowledges that teachers need to be 'lifelong learners', 'continuously learning' and engage in continuous and

effective professional learning throughout all stages of their careers (Day, 2002; Desimone, 2009, Patton, Parker & Pratt, 2013). If PD is to be valued and teachers are going to be empowered as lifelong learners, and if a change to teaching practice is to be sustained, PD needs to be embedded into the daily work of teachers. Time needs to be prioritised for PD and to make this work. The PD needs to fit into the teachers working schedules, perhaps time for collaborative practice, sharing practice or observing best practice, along with reflection needs to be built into the teachers' timetables and given priority alongside other teaching demands and priorities.

Coherence

Despite games-based pedagogy being mandated in curriculum directives, mostly due to its potential to enhance quality outcomes in Physical Education; the extent to which it aligned to the teachers' knowledge and beliefs about teaching and learning, or more specifically, how best to achieve outcomes in PE, was questioned within this study. The teachers volunteered to participate in this study, where it was presumed that they shared the goal to transform their teaching practice through the adoption of GCAs. However, early on in the study, it was clear that the teachers limited exposure to GCAs, and subsequent limited knowledge and understanding of games-based pedagogy meant that they did not understand what was required to teach using games-based pedagogy or what was expected of them as learners in the PD process. Once the teachers were provided with the opportunity to observe some demonstration lessons and engage in a needs-assessment, it was clear that the prevailing pedagogy within the faculty, and the long-standing beliefs about teaching and learning in PE, were in juxtaposition with that of games-based pedagogy. As such, there was little coherence between the PD and the proposed pedagogy, and the beliefs and knowledge of the teachers, particularly those of Barry and Fred. Guided by the recommendations of Armours and Yelling (2004, 2007), the researcher tried to achieve greater coherence by providing relevant and applicable PD activities, with ideas and practices they could use in their teaching context. The relevant and applicable PD activities appeared to engage Jenna and Sarah, where they identified a range of valued outcomes for their students when being taught using games-based pedagogy. As such, it is possible to see that there was greater coherence with Jenna and Sarah's teaching and learning goals. For Barry and Fred, it is possible to suggest that the proposed games-based pedagogy presented too great a shift in knowledge and beliefs for them to engage in the PD process. Moreover, the demands placed on the teachers to

collaborative plan their lessons and observe and reflect on their practice appeared to be beyond what they could commit to as part of their work schedule.

The findings of this study would argue that coherence needs to be a core feature of PD initiatives. The limited coherence presented in this study had implications for the PD process, impeding the teachers learning. Thus, it is suggested that there needs to be greater alignment between the teachers' knowledge and beliefs, their learning goals and what PD is offered. Teachers need to be responsible for ensuring their practice reflects the needs of their students, along with syllabus requirements, state directives and national standards. A needs-assessment is essential in identifying any inconsistencies between teachers' knowledge and beliefs and the proposed learning, and PD initiatives need to work out how to address these inconsistencies. Consideration needs to be given to how PD initiatives achieve buy-in from the teachers, so they are invested in the PD process and committed to change.

Accountability for Professional Learning

The study findings express concern regarding the limited accountability placed on the teachers for both the quality of their teaching and improvements in their teaching practice. It is argued that there needs to be an increased level of accountability placed on teachers for their ongoing professional development. This study suggests that accountability for professional development needs to be the responsibility of the teachers, both individually and collectively within the faculty, with school leaders and education authorities providing resources and structures to support a learning and development culture in schools.

Ramsey's (2000) review of teacher education reported similar concerns surrounding the limited accountability placed on teachers in NSW to meet the minimum competency requirements set by employers, suggesting self-regulation is not a feature of the teaching profession in NSW. In his report, Ramsey (2000) suggests that professional growth is a matter of individual responsibility. Echoing Ramsey's (2000) comments, the NSW Education Standards Authority (NESA) (2020) state it is the responsibility of the individual teacher to ensure they continue to hold active accreditation with NESA to remain employed. In NSW, NESA ensures all teachers are accredited at the proficient teacher level and maintain that accreditation throughout their careers. To be accredited at a proficient level, teachers must demonstrate that their practice meets 'The Standards' at the 'proficient' level and undertake applicable professional

development requirements. For example, as part of the 'Professional engagement' standard, teachers are expected to "identify and plan professional learning needs, engage in professional learning and improved practice, engage with colleagues and improve practice and apply professional learning and improve student learning" (NESA, 2018, p.18). Teachers need to complete a minimum of 100 hours of PD during each maintenance period. These NESA requirements suggest that engaging in professional development as part of this study should be the responsibility and obligation of the individual teacher since they must engage in professional learning to improve teaching practice.

Despite the mandated accreditation process placing greater responsibility on the teacher for their professional engagement and learning, this increased level of accountability did not appear to motivate the teachers' participation in the PD as part of this study. The responsibility for teacher professional development appeared to lie with the individual teacher, possibly due to the absence of a leader within the faculty. Subsequently, there was an evident lack of accountability within the faculty, both individually and collectively. There appeared to be no individual responsibility or collective expectations for the teachers' professional practice or professional learning. Similarly, there was no inter-faculty accountability, intra-faculty accountability or self-accountability for teacher learning and teaching practice. For instance, the PDHPE teachers had no formal practical teaching and learning programs or assessments for their classes. In addition, the teachers had no one checking over or evaluating their teaching programs or lessons to assess their quality.

This lack of teacher accountability proved to be a significant constraint in forging a Professional Learning Community (PLC), delivering the PD program and implementing GCAs into teaching practice. For example, the teachers did not collaboratively plan the GCA units of work as part of the planning phase of the PD process, despite allocating time during their faculty time on the staff development day. There was no accountability for completing the required GCA unit plans, and as a result, Sarah was left to attempt the unit alone. Similar findings were observed with the lesson evaluations; Sarah and Jenna needed constant reminding to complete their reflections and often failed to do this in time for planning the next lesson, meaning they did not gain the benefits of the evaluations informing subsequent practice. Additionally, the two withdrawing teacher participants were allowed to disengage with the PLC and the PD process without any question or challenge from the school Principal, the liaising Deputy or the other two remaining teacher participants.

Leadership for Learning

Randi and Zeichner (2004) argue it is not the responsibility of one person alone to lead and manage teacher professional learning; all team members have a role to play and need to contribute. Similarly, Cole (2004) suggests that it is the leadership team's responsibility to make teachers accountable for their behaviours and establish processes to promote a positive learning culture. Research tells us of the importance of school leadership for improving teaching and learning environments in schools (Cole, 2004; Helsing & Lemons, 2014, Vanblaere & Devos, 2016). There are clear links between the level of accountability placed on the teachers, both for the quality of their teaching practice and their professional learning, and the level of leadership within the faculty and the school. Notable concerns were expressed of the lack of leadership within the PDHPE faculty, contributing to the limited accountability placed on teachers for their professional learning. The findings of this study show that a high degree of leadership was not present within this setting, explaining the privation of a strong professional learning culture within the PDHPE Faculty and even the school. The teachers reported that they did not feel supported in their learning, and there were evident implications for interaction and support between the staff. The faculty had been without a Head Teacher PDHPE for the past two years because of the last Head Teacher leaving suddenly. Subsequently, their leadership had been scattered. The PDHPE faculty had been adjoined to several different faculties over the last two years and were currently assigned to the Deputy Head Teacher. Furthermore, the faculty's relationship with the school executive body appeared fractured, and communication was poor.

There was no evident leadership for teacher professional learning in the PDHPE faculty in this study. The teachers did not appear to be answerable to anyone for their current practice or withdrawal from the study; there were no accountability measures in place. These findings raise the question of who was responsible for the teacher's professional practice and their professional learning in this context. Having no Head Teacher for PDHPE had a significant impact on the teachers' professional development support. The introduction of 'The Standards' and the teacher accreditation process possibly made the teachers unfairly accountable for barriers to their learning beyond their control. There needed to be a more coherent accountability system within the school, with clear accountability measures. Processes were needed that reflected the whole-school professional learning plan and

encouraged the teachers to hold themselves and each other to account for their professional practice.

Professional learning culture

A school's professional learning culture is often considered a feature of school leadership (Cole, 2004; Helsing & Lemons, 2014; Scarino & Liddicoat, 2009). The Australian Charter for the Professional Learning of Teachers and School leaders (The Charter) (AITSL, 2012) suggests that a high-quality professional learning culture is the collective responsibility of teachers and school leaders, along with system leaders and policy-makers. Establishing a strong professional learning culture requires a high degree of leadership support for teacher learning and risk-taking, where there is a high degree of staff interaction and trust (AITSL, 2012; Cole, 2004). The Charter advocates that to change professional practice to improve students' learning, engagement, and wellbeing, system leaders and policy-makers need to enable and support a learning and development culture in schools (AITSL, 2012). In addition, school leaders need to engage in and model learning and lead a school's learning culture (AITSL, 2012). The Charter highlights the critical role school leadership teams and education authorities such as AITSL and NESA play in supporting the professional learning culture in schools.

The findings acknowledge that teachers need to take responsibility for their professional learning and actively engage in professional development to build their capacity and that of others (AITSL, 2012). This study proposes that there needs to be a high degree of leadership support for teachers to engage in continuous and ongoing professional learning (AITSL, 2012). Additionally, leaders both at the school level and at the system and policy-maker level need to provide recognition, endorsement and even incentive for evidence of Professional Development. As such, the findings of this study emphasise the role of the school leadership team, along with NESA and AITSL, in supporting the teachers in their professional engagement and ensuring they are provided with structures and resources to meet these professional learning demands.

Teacher Agency

Priestly, Biesta and Robinson (2015) describe 'agency' as "the interplay of individuals' capacities and environmental conditions" (p.3), emphasising the interaction of teacher agency within the cultural and social and material structures of the school (Priestly, 2010). Maclean et al. (2015) suggest individual agency can be constrained or enabled, where teacher agency is dependent on teachers' prior experiences, knowledge, and motivation (Priestly, Biesta & Robinson, 2015). In the case of this study, all four teachers' prior experiences, knowledge, and motivation affected their agency and capacity to enact and sustain change. However, in the case of Jenna and Sarah, the PD initiative was successful in building their capacity and enabling teacher agency. Although, many components of the school culture and structure constrained teacher agency. These findings draw many similarities with Maclean et al. (2015), suggesting that teacher agency combined with school culture and structures are crucial factors influencing teacher capacity to enact change. As such, supporting Priestly, Biesta and Robinsons (2015) suggestions, this study argues that the 'ecologies' within teachers work are crucial in supporting and facilitating change. PD initiatives need to enhance teacher agency. However, these initiatives must focus beyond individual capacities, focusing on the factors and dimensions that shape the teachers' ecologies (Priestly, Biesta & Robinsons, 2015). In the case of this study, this means providing structures and resources for professional development, enabling time for professional learning, opportunities to share practice and collaborate and promote reflective practice.

An emerging leader

Interestingly, in the absence of a formal or appointed leader in the PDHPE faculty, Sarah presented herself as an emerging 'leading agent' and took on the responsibility of driving the PD forward and leading the PD process. The researcher notes this observation in her reflection, saying, "I guess my main reflections again are that Sarah is the driving force". (Researcher reflection journal, 1st May 2014). Sarah was responsible for completing the units of work and lesson plans, as well as communicating with the researcher.

Similarly, the researcher assumed a leadership role, providing a level of accountability during the PD process and a catalyst for change for the teachers learning. It could be that this increased level of accountability presented by Sarah, and the researcher encouraged Jenna to continue

with the PD process and persevere with the implementation of GCAs. Equally, this may have contributed to the withdrawal of the two other teacher participants.

In this study, the researcher acted as a leader alongside Sarah who emerged as a 'leading agent' within the PLC. These leadership roles proved to be crucial in encouraging and supporting the teachers to engage in professional learning and holding them accountable for their learning and professional practice. The teachers explained that they were held accountable for 'getting things done' (Jenna, Teacher interview, 18 June 2014), making them focus on their planning and evaluation. The teachers commented, "We have to do it - there's an expectation" (Jenna, Teacher interview, 18 June 2014). Similarly, Cole (2004) argues, "school leaders need to take more responsibility for establishing a professional learning culture within the school" (p.9). These findings can be linked to the infrastructure and support offered in PLCs. Wenger (2000) suggests it is necessary to have "a core of participants whose passion for the topic energises the community and who provide intellectual and social leadership" (p. 141).

In the same way, this study advocates that GCA-PD offers the same infrastructure and support, identifying leadership to promote learning. Wenger (2000) identifies positions for 'knowledge managers' and 'thought leaders' in the infrastructure of PLCs, whose role is to facilitate the learning process. In the same way, this study advocates the need for a leader within PLCs and links to an 'expert' body, universities and PD providers.

Despite the research suggesting that it is the role of school leaders to establish a professional learning culture within the school, this study suggests that the professional learning culture of a school is a shared responsibility, not one that falls solely upon the leadership team. It recommends that schools need to be viewed as PLCs, establishing professional learning teams within schools, encouraging teachers to work collaboratively within their faculties and wider school groups. Furthermore, it suggests, professional learning needs to be embedded into the daily roles of teachers and considered as continual growth within the profession.

Limitations of the study

There are a number of limitations observed in this study that the researcher did not or could not control. Acknowledging these limitations is essential to not inappropriately to affect the findings and to inform any conclusions that can be drawn from the research. Despite

acknowledging the capacity of GCAs to enhance educational outcomes for students, it is important to note; this study does not address student learning or the change in the students' learning outcomes as a result of being taught using game-centred pedagogy. Exploring student learning as a result of GCAs is an area recommended for future research. However, this study does examine the influence of the students' response to being taught using GCAs on the teachers' implementation of game centred pedagogy. Furthermore, this study may provide insight supporting the move towards more effective PD, particularly in the context of PE and implementing GCAs.

The limitations of this study include:

- Generalisation of the results
- Teacher participant withdrawal
- Researcher bias/objectivity
- Change in student learning was not measured as evidence of Professional Development (PD) efficacy (Links to improved student learning is made but not measured)
- Short term basis for Continual Professional Development (CPD)

Generalisation of results

The participants in this study were limited to four in-service teacher participants within one PDHPE faculty. The PDHPE faculty was within a selected school in the Sydney North Shore region in the state of NSW. The Professional Development, by its nature was personalised and individualised to the needs of these four teachers. The individualised nature of the PD was a specific case study, it was naturalistic in its nature and context specific and as such, it may be argued that the findings from this study can only be generalised to the four in-service teachers and may not be reflective of other PLCs, faculties or schools. It is acknowledged that it would be problematic to generalise the findings of this study more widely and to control for additional professional learning opportunities. However, the purpose of this study is to ensure that the research and PD model identified was contextualised. The merits of case study research are discussed in the methodology chapter, where it is argued that case studies can indeed have a generalising effect (see Stake, 2000). Furthermore, the details provided in reporting this study make it possible to replicate and allow readers to consider the results in relation to their own situations (Gay & Airasian, 2000).

Teacher participant withdrawal

Additionally, it may be suggested that the research is further limited as a result of the two teacher participants withdrawing from the study in the first two phases of research, leaving only two remaining teacher participants. All teachers had the right to withdraw their participation and or their data from the study at any time and without giving any reason. Despite the teachers withdrawing their participation from the study, they were happy for the data already collected to be used within the study. As such, this data collected from the two teachers during their participation provided sufficient data for analysis, where their actions have contributed to the research findings. The withdrawal of these two teachers provided insights into the efficacy and sustainability of PLCs in educational contexts and why learning may not happen as a result of PD activity.

Researcher bias/objectivity

The researcher was fully engaged with the teacher participants who were being observed. As Angrosino (2007, cited in Creswell, 2013) suggests, this helps establish a greater rapport with the people being observed. However, it also causes concern with regards to researcher bias and objectivity. Moreover, the researcher was also the facilitator for the professional development, where the researcher designed the conceptual model and conducted the professional development workshop, and thus experimenter effects may have occurred. Hammersley (1992) argues that while it is important for researchers to be aware of their views, "… we can never entirely escape our assumptions about the world" (p.169).

Consequently, Hammersley suggests, not only should the researcher avoid close relationship with respondents, which could lead them to neglect reality, but they should also not accept every response without questioning their view of reality. In this study, the close relationship between the researcher and the participants was vital for the learning culture of the PLC. This study sought to minimize this possibility of researcher bias through debriefing, member-checking and triangulation of data from a variety of sources.

Change in student learning was not measured as evidence of PD efficacy (Links to improved student learning is made but not measured).

This study does not address student learning or the change in the students' learning outcomes

as a result of the PD activity or being taught using game-centred pedagogy. Measuring student learning would have been a valuable addition to the study, especially considering the students' response having a significant impact on the teachers' participation in this study. As such, this study does examine the influence of the students' response to the change in pedagogical practice, as a result of being taught using GCAs.

Short term basis for Continual Professional Development

Despite the study acknowledging the continuous and ongoing nature of teacher Professional Learning and Development, the study was limited to the shorter duration of one term. Initially, it was hoped that the research would span two terms. However, a range of barriers were presented that impacted on the research spanning this timeframe. The six-week period proved to be enough time to facilitate some change to teaching practice, although, longer and ongoing PD would further penetrate practice and have greater capacity to sustain the proposed pedagogy; reinforcing the need for continuous professional development.

Chapter conclusion

The findings of this study support that PD can support teachers' learning and facilitate change in teaching practice. However, the learning culture must be supportive and conducive to learning. The elements of PD grounded in this study had positive and negative aspects that both supported and, in some cases, inhibited learning. There were two very different outcomes for the two teachers that remained engaged in the PLC and the PD process and the two that disengaged and withdrew. The findings reinforced the need for PD in its entirety to be contextualised and individuals to cater for teachers' learning needs. Although this study sheds some light on the barriers and facilitators that impact on teachers learning, these are contextualised and specific to this setting, there needs to be more clarity around the teachers' needs and learning context, in order for them to be translated to other settings. The findings here reinforce much of the PD literature. However, highlight the needs for a personalised approach to PD.

Chapter 7

Conclusion and Recommendations

Introduction

This chapter concludes the study, summarising and reflecting on the research aims and its findings. In answering the major research question, 'What are Physical Education (PE) teachers' experiences of and responses to a professional development model designed to support their implementation of games-based pedagogy?', a number of conclusions can be reached which are presented in this chapter. The practical and theoretical implications of this study are considered. Recommendations for future research both in the field of Professional Development and research within Game Centred Approaches (GCAs) are discussed, along with recommendations for future practice, particularly that of Game Centred Approach Professional Development (GCA-PD).

Implications of this research

The findings of this study are significant in the sense that they demonstrate that Professional Development (PD) initiatives can work and can be successful in supporting the implementation of GCAs. To this effect, the findings of this study provide insight to educational policy-makers, educational administrators, curriculum support workers and PD providers, as well as school principals, leaders and teachers on ways to support teacher learning and facilitate change to teaching practice. At the same time, the findings of this study offer a stark reminder that teacher learning is a complex process (Timperley et al., 2007) impacted by a range of contextual factors. More specifically, the findings of this study reinforce that implementing games-based pedagogy such as GCAs demands more complex conceptualization of teacher professional learning (Opfer & Pedder, 2011), that considers a wide range of contextual factors within the educational setting (Memmert et al. 2015). In this sense, the findings of this study contribute to the literature that shows PD that aims to bring about change is a complex and timely process.

Moreover, the findings of this study help to understand what effective PD processes are, whilst also highlight why PD may be ineffective, identifying both facilitators and barriers that impact learning. The personalised nature of learning and PD is emphasised, where it is shown

that for PD to support teachers learning, it needs to be tailored to their individual needs and context. To this effect, the findings reinforce Guskey's (1994, 2002) research showing that there is no single form of CPD that is appropriate for all teachers. What is required is an 'optimal mix', "that assortment of professional development processes and technologies that will work best in a particular setting" (Guskey, 1994, p.7), that suits individual teachers at different stages in their development (Armour & Makopoulou, 2012). As such, this study has provided insight into why learning may or may not occur as a result of PD initiatives, particularly in the context of GCAs. To this end, the findings and subsequent recommendations inform PD providers and leaders of the importance of addressing teachers' individual needs and strategies for assisting teachers and leaders to facilitate change to their teaching practice.

The practical significance of this study helps guide those learning to teach using GCAs. The findings of this study show that learning to teach using new pedagogies, in this case, GCAs, is a difficult and timely process, where it is proposed that GCAs in their entirety are perhaps too complex to teach when learning new pedagogies or if inexperienced. Effective PD needs to focus on building knowledge and skills, "teachers must enhance their subject-matter and learn new teaching strategies (Corcoran, 2015, p.1). The timely and challenging nature of PD needs to be considered in any PD initiative that supports the implementation of productive pedagogies such as GCAs. In this regard, the findings of this study contribute to the understanding of GCAs and provide information leading to an effective model of PD that supports teacher learning when implementing game-based pedagogy. Consideration needs to be given to supporting teachers in translating theory into practice and implementing what they have learnt since the teachers in this study encountered diverse difficulties at different phases of the PD.

In considering the theoretical implications of this study, the findings advocate Action Research as an effective PD process; although they warn of the time-consuming nature of such a process. Similarly, the findings would support Professional Learning Community (PLCs) as an effective platform for AR and teacher learning. Both AR and participating in a PLC, particularly those that are linked and affiliated with Universities or researchers, provide opportunities for teachers to direct their own learning and provide a framework for developing informed practice, and help translate theory into practice. However, they show the problematic nature of PLCs in educational contexts, showing the potential for PLCs to be

ineffective mechanisms for learning in educational contexts unless there is a supportive culture for learning, and there is buy-in from staff, where all staff share the same vision and have time to engage and take an active role in the PLCs. Effective leadership and accountability measures need to be in place if the learning culture is to be conducive to PLCs.

Recommendations

In considering the findings and the discussion of the findings, supported with relevant literature from the field, a number of implications for both the theory and the practice can be observed making it possible to suggest some recommendations for future research and future PD initiatives, particularly in the field of GCAs. In addressing the limitations of this study, a number of recommendations for future research can be made, to contribute to an understanding of how PD initiatives can be developed to support teacher learning and facilitate change to teaching practice, specifically in the context of GCAs.

Future research

- This study provided a case study of four teachers within the same faculty, with two teachers withdrawing their participation. Although their withdrawal still informed the findings, it impacted on the effectiveness of the PLC. Future research using PLCs needs to ensure there is buy-in from all members and a shared vision within the community and between its members, in order to support their effectiveness and sustainability. There is an opportunity for future PLC research to report on ineffective PLCs and contribute to the dearth of literature around unsuccessful PLCs, providing insight into the reasons why PLCs may fail or be unsuccessful and what can be done to increase their effectiveness. Yielding the results of this study, it would be beneficial to examine how PLCs establish a shared vision and get buy-in from staff, as well as examining how schools make time for collaborative and reflective practice as part of the PLC.

- A similar Action Research study could be undertaken with members of the PLC from across different schools, or even the potential to conduct a comparative study between different PLCs. This will potentially shed even more light on best and effective practice when conducting PD, and supporting teacher learning, gaining deeper understanding of the barriers and facilitators that support and inhibit learning.

- It would also be interesting to examine the effectiveness of the proposed PD model in

supporting the delivery of other innovative and productive pedagogies. Exploring other innovative models using this model of PD would contribute to the generalisability of the findings, also presenting an opportunity to compare the results of this study to other contexts. As a result, a shared understanding of PD could be developed. Further insight could be gained into whether the barriers to and facilitators of learning, and the effective PD characteristics are similar across contexts, despite what the teachers are learning to teach, and the PD is supporting.

- Continued research is needed to examine the teachers' delivery of GCAs in sporting areas other than the invasion games unit in this study. Exploring other sporting areas will inform the research as to the sustainability and transferability of the teachers learning. The teachers experienced difficulties translating the theory into practice. Thus, it would be interesting to see whether the teachers are able to transfer what they have learnt to other areas of PE. Exploring the PD in a range of PE units was the initial intention of the research. However, time limitations prevented this from being carried out. Future GCA-PD research or any PD research needs to ensure it is long term. As the literature suggests, and this study agrees, teacher learning is an ongoing process, facilitating change to teaching practice is a lengthy and time-consuming process. Thus, research examining the effects of PD needs to be an ongoing and long-term investigation.

- Future research in this field would benefit from measuring any change in student learning as additional evidence of the effectiveness of the PD. Given the aim of most PD initiatives is to improve student learning, it was remiss of this study to not measure the impact on student learning or learning gains and improved learning outcomes as a basis of measuring the effectiveness of the PD. Measuring the impact on students' learning would have been particularly beneficial in this study given the findings reporting the teachers' perceived valued outcomes for their students as a result of their gams-based lessons.

- There is a dearth of literature that explores in-service or experienced teachers' perceptions of and experiences of GCAs (Harvey & Jarret, 2014). Most of the GCA literature focuses on pre-service teachers, where the findings of this study highlight the pedagogical and knowledge difficulties associated with these inexperienced teachers. There is the opportunity for future research to focus on experienced teachers, who have

established beliefs and values about teaching, offering insight into how best to support and facilitate change with entrenched pedagogical practice, beliefs and values.

Recommendations for future Game Centred Approach-Professional Development initiatives

There are a number of practical implications as a result of this research that may help inform those learning to teach using GCAs or those supporting learning by offering GCA-PD initiatives. The findings of this study show that learning to teach using games-based pedagogy is a difficult and complex process, that takes time and requires a commitment to change. As Guskey (2002) suggests "Learning to be proficient at something new and finding meaning in a new way of doing things requires both time and effort" (286). Teachers need to be motivated and committed to change their teaching practice and adopt productive pedagogies such as GCAs. Implementing GCAs can be challenging and demanding of teachers pedagogical and content knowledge. Learning to teach using GCAs can be fraught with difficulty, particularly for those inexperienced teachers, or those that are not familiar with productive pedagogy such as GCAs. As such, GCA-PD is a complex process and need to take into consideration the wide variety of situational issues and contexts. The findings of this study should inform GCA-PD initiatives, in particular the facilitators and barriers to learning, if they are to support teachers to implement GCAs into their teaching practice.

A focus on Pedagogical Content Knowledge (PCK)

Limited knowledge and limited exposure to productive pedagogies such as GCAs were identified as a leading barrier in this study. The findings of this study show that GCA-PD initiatives need to build teacher capacity to implement GCA by building both their subject content knowledge of games and the pedagogical knowledge required to implement them. In particular, GCA-PD needs to help develop teachers' knowledge and understanding around the tactical aspects of games and teacher capacity around questioning strategies, authentic assessment and modifying and adapting games to highlight the tactical elements of games and what this looks like in games lessons. Although there are benefits in developing the subject matter knowledge separately to the pedagogical knowledge, this may lead to a disconnect in translating theory into practice when implementing GCAs. Thus, it is recommended that both subject matter knowledge and pedagogical knowledge are developed simultaneously by PD initiatives. Timperley et al. (2007) suggest that professional learning activities need to be

focused on translating theory into practice, where teachers need to be presented with multiple opportunities to learn through a range of activities. Pill (2012) identify the key role Universities play in exposing PETE students to curriculum pedagogical knowledge and content bases for sport teaching in physical education.

In this study, to build pedagogical content knowledge, the researcher used questioning scaffolds such as the 'debate of ideas' protocol (Gréhaigne, Richard & Griffin, 2005). Harvey and Light (2014) recommend the use of other questioning protocols such as the Initiation, Response, Evaluation (IRE) model of questioning (Cazden, 2001), using 'skinny and fat questions' (Kagan, 2005), types of thinking and question starters (Kracl, 2012), the GROW model (Gallwey, 1974) and the reflective toss (van Zee & Minstell, 1997). This study also used the Games Performance Assessment Instrument (GPAI) (Oslin, Mitchell & Griffin, 1998) to help scaffold and conduct some authentic assessment. The GPAI was used to develop both a teacher and peer assessment. Although, the findings showed that the teachers needed to develop their knowledge and understating of the GPAI, and its elements, before conducting a peer assessment. This study selected only three of the six-game components to focus on at a time, where this was possibly too difficult when first learning to implement the GPAI. Teachers needed sound knowledge of games in order to develop appropriate and meaningful learning experiences that included modified games.

When learning to implement GCA pedagogy, it is advised that PD initiatives draw on the teachers' current knowledge and understanding and use familiar content knowledge to help reduce the demands of the PD. Drawing on teachers' current knowledge and understanding helps by allowing the teachers to focus more on the pedagogical aspects rather than also having to develop subject matter knowledge. Although, this study recommends that PD initiatives simultaneously build subject matter knowledge and pedagogical knowledge to support teachers to translate theory in practice. Having a strong knowledge base helps to support teachers with the instructional demands of implementing GCAs. Building time to reflect on practice is recommended as part of any PD process. There are advantages of this reflection being done collaboratively, although time restrictions associated with such practice. As with the AR process, teachers need to be guided through their reflection, particularly if they do not know what best practice looks like when reflecting.

Reduce the complexity of GCAs / Minimise instructional demands

The findings of this study would suggest that for inexperienced teachers, or teachers being introduced to games-based pedagogy for the first time, that the pedagogical demands of games-based pedagogy or the complexity of GCAs may be too demanding. Thus, the complexity of GCAs needs to be reduced, and the instructional demands need to be minimised so that those learning to teach can focus on developing one element at a time and build up to the more holistic implementation. This suggestion shares a similar philosophy to games-based pedagogy itself, whereby the tactical complexity of games is reduced to support the students learning games concepts and skills (Jarrett & Harvey, 2016). This recommendation is in contrast to other research that suggests a holistic approach needs to be adopted, where teachers and coaches need to demonstrate all instructional elements to implement GCAs authentically. Gurvitch, Blankenship, Metzler, and Lund (2008), Harvey et al., (2016b) and Harvey and Robertson (2017) identify four 'non- negotiable' teacher benchmarks, which included:

1. teacher uses tactical problems as the organising centre for the learning tasks,
2. teacher begins each lesson with a game form to assess students' knowledge,
3. teacher uses deductive questions to get students to solve tactical problems,
4. teacher uses high rates of guides and feedback during situated learning tasks.

However, this study recommends that PD initiatives need to scaffold learning around these four 'non-negotiable' elements, introducing one element at a time and only introducing the next element when evidence of proficiency in practise of the element has been observed. Teachers need to be given the opportunity to experiment with implementing each of these elements in planning and practice, developing their knowledge and understating of what is required to effectively implement the element and the capacity and skills to translate this into practice.

Teaching experience

The finding of this study showed that teaching experience or teachers more adept with classroom management practice are in a better position to effectively implement GCAs, particularly if they are motivated to transform their pedagogical practice. More experience in teaching provides teachers with a better capacity to learn new and innovative approaches such as GCAs. This impact of experience has implications for pre-service teachers and inexperienced teachers, who may experience difficulties with games-based pedagogy until

they have gained skill and confidence in classroom management. As a result, less experienced teachers may require additional support or may even be better learning to implement GCAs once they have gained some teaching experience and established a sound knowledge and understanding of games. Harvey and Jarret (2014) and Light (2008) identify the need for additional GCA inductions and development measures in PETE programmes and in the professional development of newly qualified and in-service teachers with the underpinning development of constructivist and autonomy-supporting pedagogies.

Much of the research surrounding experienced teachers and pedagogical change identifies their scepticism when faced with innovation and new ideas, and their resistance to change (Butler, 2006, Oslin and Mitchell (2006). This scepticism and resistance to change was certainly the case for Barry and Fred in this study. However, in the case of Jenna, more experienced teachers who are open and receptive to change have the potential to be 'key players' (Butler, 2006) in the change process, due to their influential and knowledgeable position. There is an opportunity for inexperienced teachers or beginning teachers to be linked with more experienced teachers as a mentor to guide and support their practice. These experienced teachers need to take on leadership roles within PLCs to guide practice. Burbank and Kauchak (2003) draw similar conclusions advocating for collaborative action research as a PD strategy, combining groups of teachers in the design, implementation, and evaluation of action research projects, where "collaborative sharing between pre-service and in-service teachers provides opportunities for structured dialogues and professional linkages" (p.500).

Provision of demonstration lessons and resources

Teachers learning to teach using games-based pedagogy need to be provided with the opportunity to observe demonstration lessons and provided with relevant resources to better illustrate what GCAs look like in practice, in order to support their planning and implementation of GCAs. The findings of this study reinforce the need for situated and contextual support. Thus, would recommend demonstration lessons being conducted using the teachers' own classes. This helps to contextualise the PD and support learning since teachers can see the pedagogy being successfully implemented with their own students in their setting. Teachers need to be given resources that are relevant and specific to what the teachers have decided to teach. For example, game category, sporting activity, age and stage of learner. Merely providing the resources is not enough; teachers need to be shown what

these resources look like in practice and need guidance translating the theory in their actual lessons. This means that PD providers need to take the PD to the teachers, instead of the teachers coming to the PD.

Collaboration with external expertise

PD initiatives, particularly those using PLCs would benefit from the input and collaboration with an external expert, bringing new perspectives and ways to think about their existing practice, and challenging the prevailing dialogical norms (Timperley et al., 2007). External expertise can come from researchers, University lecturers and academics, specialists in the field or even other teachers. As Timperley et al. (2007) recommend, external experts need to be knowledgeable of content and teaching practices that make a difference to students learning, as well as how to deliver that content and make it meaningful to teachers and manageable within the context of teaching practice. The findings of this study recommended that these experts need to familiarise themselves with the context and setting in which the PD is being delivered whilst providing unbiased and subjective support. External experts need be in schools, working alongside teachers in interactive, practical and iterative ways, involving them in discussion and the development of meaning for their classroom contexts. This kind of situated and contextualised PD will support the success and sustainability of the PD. As such, school leaders and policy-makers need to ensure funding is available to support these links and time is made available for teachers to liaise with these experts. PD providers need to forge and sustain these links.

Establish a strong learning culture

The findings of this study empathise the importance of establishing a strong culture for learning within the school. The school environment, structures, and practices need to support learning and foster the type of professional community that encourages collaboration and sharing practice, reflection. AITSL (2012) stresses the importance of collaborative professional learning as well as the role of the school leader in supporting a collaborative learning culture. The Australian Professional Standards acknowledges the instrumental role of the school leader in creating and maintaining a collaborative professional learning culture (See: Australian Professional Standard for Principals [the Standards], AITSL). Teachers need to be encouraged to set goals for their teacher and student learning. Leadership and accountability for learning are instrumental in developing and sustaining this culture. School

leaders need to actively lead learning opportunities, providing support and structures for teacher and student learning. All teachers need to be encouraged to engage in lifelong learning and to continually develop their teaching practice, to benefit all learners. Teachers and leaders need to be held accountable for their learning and professional practice. Engaging teachers in PLCs within and between schools, where teachers are encouraged to engage in collaborative and reflective practice, provides a supportive network for learning, with increased and mutual accountability on teachers for their learning and practice. School structures must permit time to be allocated for teacher professional development where time needs to be built into teachers' workloads, and timetables, so professional learning is prioritised.

Leadership

The findings of this study suggest that effective leadership is fundamental to the success of any PD initiative and is essential for establishing and sustaining PLCs. Leadership for learning, needs to be a key component of the school culture, with key teachers identified as leaders in school communities and affiliated to groups of teachers in PLCs. Structures need to be put in place for these leading teachers to collaborate and support other teachers as part of the PLC. The role of these leaders is to build capacity and autonomy of other teachers, whilst challenging their beliefs about teaching and learning. Collegial relationships between the leadership team and classroom teachers are fundamental in supporting learning. Timperley et al. (2007) identify the key roles of leaders associated with effective outcomes for teachers which include, developing a vision coherent with wider environmental and school policies, managing and organising professional learning, leading the professional learning and developing the leadership of others. Managing and organising professional learning as part of this leadership role plays a significant role in ensuring the learning culture and structures within the school promote and support learning. Timperley et al. (2007) believe this role includes,

- establishing learning priorities and reducing competing demands,
- engaging reluctant participants by putting forward compelling reasons to do so,
- providing effective content, and engaging teacher theories, ensuring focused and productive opportunities to learn,
- engage appropriate expertise and promote participation in professional communities focused on promoting the teaching–learning relationship in evidence-informed ways.

(Timperley et al., 2007, p.193)

Accountability

The findings of this study showed how engaging in AR and participating in the PLC as part of the PD process increased the level of accountability placed on the teachers for their teaching and learning practice. PLCs have the potential to apply accountability at the individual and group level. This increased accountability may be problematic for PLCs if not all teachers are committed to learning or share the vision for teaching and learning. Conversely, PLCs can be problematic if measures are not in place to ensure teachers are held accountable for their teaching and learning practice. As such, it is posited that there needs to be accountability for learning if PD is to facilitate change to teaching practice, and PLCs are to be effective. School with high accountability need to have compliance measures in place where targets are set for teaching and learning, and individual teachers need to set learning goals for their own practice. School leaders need to be responsible for ensuring there is coherence between the school's aims, the teachers' goals, the PL goals and the accountability measures. However, there needs to be a shared responsibility and mutual accountability in achieving these goals.

Providing and prioritising time for professional learning

Sufficient time needs to be provided and prioritised for teacher learning. Time needs to be built into school structures and teachers' timetable. Structures should be put in place to allow teachers to use this time for learning, collaboration and reflection effectively. School and teachers need to prioritise their time for learning activities. Watts and Castle (1992) identify five strategies used by educators to find time more time for professional development, these include, using freed-up time, restructured or rescheduled time, common time, better-used time, and purchased time. Schools might benefit from trialling these strategies when fostering a strong learning culture in order to prioritise time for learning.

Aligning beliefs and attitudes

The findings of this study show that coherence between the teachers' beliefs and attitude on the PD aims and goals is essential to the success of any PD initiative. The teachers' beliefs and attitude towards teaching and learning, in particular their beliefs of how best to achieve outcomes in PE and their response to change, has a direct impact on the success of any

change or PD initiative. A teacher's practice is underpinned by their beliefs and values about teaching and learning (Kennedy, 1998), "Effective teaching practice is based on a coherent and integrated set of beliefs and values" (Timperley et al. 2007, p. xxix). There needs to be coherence between the teachers' beliefs and attitudes and the learning goals and intentions of the PD. PD initiatives need to provide teachers with the opportunity to reflect on their beliefs and practices. If there is little coherence between the teachers' beliefs and values and the proposed pedagogy being taught as part of the PD initiative, then it is doubtful that any change will be facilitated.

Consequently, leaders for learning or PD providers need to address teachers prevailing beliefs and attitudes about teaching and learning if they are to infiltrate practice. There needs to be coherence between the aims and the goals of the PD, and the teachers' beliefs and attitudes. The change process needs to be instigated from changing teachers' beliefs, and attitudes about learning and how best to achieve outcomes before any change to practice can be initiated. Changing beliefs and attitudes can be a slow process, PD initiatives need to be ongoing in recognition of this, in order to best infiltrate practice.

Recommendations for Action Research as a Professional Development strategy

The findings of this study advocate AR as a GCA-PD strategy. Although they identify the timely process of such professional learning, AR is promoted as a comprehensive framework for developing informed practice. AR as a PD strategy, particularly conducted in an effective PLC, provides the opportunity to offer personalised and tailored learning, where PD is contextualised and designed to meet the teachers' individual needs. The need for personalised and situated PD was a core finding of this study and is suggested to be fundamental to the success and effectiveness of any PD initiative. The continuous assessment of the teachers needs through the AR and PD process is believed to be fundamental in shaping and tailoring the PD to meet the teachers' individual needs. The AR process ensured that the teachers were actively engaged in their own learning, whilst being situated and contextualised to the teachers own setting.

This study would recommend including an initial needs assessment at the start of any PD or AR process since this provided a starting point for the PD. The AR allowed the areas of knowledge and understanding and experience to be identified. The AR process also enabled any disparity between the teachers to be identified. It is recommended that the needs-

assessment examines not only the teachers' knowledge and understanding, but also the extent to which the teachers identified with the PD aims and goals, and share the PD vision of the PLC. It is also advised that the initial needs assessment identifies the teachers established pedagogical practice and beliefs and values about learning and achieving outcomes since this can impact on the success of the PD. The PD process being carried out on-site as opposed to off-site, decontextualised PD.

Engaging participants in the continuous process of planning, acting, observing and reflecting, as per the AR cycle, allows for reflective and informed practice and for individual needs to be addressed. However, as with this study, teachers may need to learn how to plan, what to observe and how to reflect as part of the PD process. In order to support the teachers to implement the chosen pedagogy, PD providers also need to support their learning of the AR process.

Recommendations for Professional Learning Communities in an educational context

The findings of this study advocate the use of PLCs as a platform for teacher professional learning, particularly core features such as collaborative and reflective practice. However, this study recognises the problematic nature of PLCs in educational contexts. The greatest challenges to PLCs in this educational setting included buy-in, accountability and time. As such, it is suggested that more research needs to be conducted, reporting on ineffective or unsuccessful PLCs and as a result, what can be done to establish and build effective PLCs. More research is needed that explores how to rebuild or restructure ineffective or unsuccessful PLCs, taking into consideration the challenges presented in this study. Particular consideration needs to be given to sustainability and longevity or PLCs and how barriers to learning can be overcome. Leadership and accountability are identified as essential components for effective PD and thus may be key features in establishing and sustaining PLCs. The findings of this study suggest that in educational contexts, buy-in and shared vision can be problematic in PLC. Future research needs to identify how best to obtain buy-in from teachers and how to develop a shared vision and values and how school leaders ensure coherence between school aims and teaching goals. The findings of this study showed that collegial relationships are needed to sustain effective PLCs. Thus, when assembling PLCs, the relationships in and between members need some consideration. If PLCs are to be effective and support any PD initiative, time needs to be made available for members to

collaborate, share practice and reflect. The learning culture within the school needs to be supportive and open to learning.

Revised Professional Development model

The initial PD model posited in this study can be revised and refined to reflect these findings and recommendations. In reflecting on the initial model, it is superfluous to include the elements of active learning, situated and reflective, given the inclusion of AR as the PD strategy. The nature of AR ensures the PD is both situated and contextualised, and in this case, it also ensures that the PD is personalised and tailored to the teachers' needs; the AR process embeds these characteristics into the planning, acting, observing and evaluating cycle. By conducting the AR as a PD strategy within PLCs also ensures that teachers are engaged in collaborative and reflective practice. As such, the PD characteristics that are deemed essential to the effectiveness of PLCs and the success of any PD initiative, can be refined to include

1. Capacity building, which includes building teacher autonomy and agency,
2. A focus on PCK, rather than just knowledge building,
3. Coherence between schools aims, teacher goals and the PD offered,
4. Continuous and ongoing support throughout teacher careers,
5. Leadership and accountability for teaching and learning, and
6. Time prioritised for learning.

Chapter Conclusion

This chapter has summarised the main findings of this study, considering the practical and theoretical implications of the results. In considering these implications, this chapter has proposed a number of recommendations for future research, and future GCA-PD initiatives. In particular, this chapter has advocated AR as a PD strategy. Although acknowledges the difficulties associated with PLCs in educational contexts, suggests they can be effective mechanisms to support change in teaching practice. This chapter has reinforced the complex nature of teaching learning and recognises the need for complex PD to support this learning, that takes into consideration the wide range of contextual issues in educational settings. In conclusions, this study calls for personalised PD that is tailored to teachers' individual needs and contexts. It acknowledges the potential AR and PLCs have to provide this PD opportunity for teachers that are committed and motivated to learn.

References

Adams, P. (2006). Exploring social constructivism: Theories and practicalities. *Education 3-13, 34*(3), 243–257.

Agee, J. (2009). Developing qualitative research questions: A reflective process. *International Journal of Qualitative Studies in Education, 22*(4), 431-447.

Ahmad Aliya, A., Singhry, I, M., Adamu, H., & Abubakar, M, M. (2015, December 22). *Ontology, epistemology and axiology in quantitative and qualitative research: Elucidation of the research philosophical misconception.* [Paper presentation]. The Academic Conference: Mediterranean Publications & Research International on New Direction and Uncommon Vol. 2 No. 1. University of Agric, Abekuta, Abekuta, Ogun State, Nigeria.

Almond, L. (1986). Asking teachers to research. In R. Thorpe, D. Bunker & L. Almond (Ed.), *Rethinking games teaching* (pp. 7-10). Department of Physical Education and Sport Science, University of Technology, Loughborough.

Almond, L. (2010). Forward: Revisiting the TGfU brand. In: Butler J and Griffin L *(Eds.), More teaching games for understanding: Moving globally* (pp. vii-x). Human Kinetics.

Altrichter, H. (2005). The role of the 'professional community' in action research. *Educational Action Research, 13*(1), 11-26.

Arias, J. L., & Castejón, F. J. (2012). Review of the instruments most frequently employed to assess tactics in physical education and youth sports. *Journal of Teaching in Physical Education, 31*, 381-391.

Armour, K., Makopoulou, K., & Chambers, F. (2012). Progression in physical education teachers' career-long professional learning: Conceptual and practical concerns. *European Physical Education Review*, *18*(1), 62–77. https://doi.org/10.1177/1356336X11430651

Armour, K. M., & Makopoulou, K. (2012). Great expectations: Teacher learning in a national professional development programme. *Teaching and Teacher Education*, *28*(3), 336–346. https://doi.org/10.1016/j.tate.2011.10.006

Armour, K. M., & Yelling, M. (2004). Professional ëdevelopmentí and professional ëLearningí: Bridging the gap for experienced physical education teachers. *European Physical Education Review*, *10*(1), 71–93. https://doi.org/10.1177/1356336X04040622

Armour, K. M., & Yelling, M. (2004a). Professional 'development' and professional 'learning': Bridging the gap for experienced physical education teachers. *European Physical Education Review*, *10*(1), 71–93.

Armour, K. M., & Yelling, M. (2007). Effective professional development for physical education teachers: The role of informal, collaborative learning. *Journal of Teaching in Physical Education, 26*(26), 177–200.

Armour, K. M., & Yelling, M. R. (2004b). Continuing professional development for experienced physical education teachers: towards effective provision. *Sport, Education and Society*, *9*(1), 95–114. https://doi.org/10.1080/1357332042000175836

Atencio, M., Jess, M., & Dewar, K. (2012). It is a case of changing your thought processes, the way you actually teach: Implementing a complex professional learning agenda in Scottish physical education. *Physical Education and Sport Pedagogy, 17*(2), 127–144.

Atkins, L., & Wallace, S. (2012). Analysing and reporting qualitative data. In *Qualitative research in education* (pp. 207). SAGE Publications.

Attard, K., & Armour, K. (2006). Physical education and sport pedagogy reflecting on reflection: A case study of one teacher's early-career professional learning. *Physical Education and Sport Pedagogy*, *11*(3), 209–229. https://doi.org/10.1080/17408980600986264

Attencio, M., Jess, M., & Dewar, K. (2012). It is a case of changing your thought processes, the way you actually teach. *Physical Education and Sport Pedagogy*, *17*(2), 127–144.

Australian Institute for Teaching and School Leadership (AITSL). (2011). *Australian professional standards for teachers*. http://www.aitsl.edu.au/australian-professional-standards-for-teachers

Australian Institute for Teaching and School Leadership (AITSL). (2012). *Australian Charter for the Professional Learning of Teachers and School Leaders: A shared responsibility and commitment*. https://www.aitsl.edu.au/docs/default-source/national-policy-framework/australian-charter-for-the-professional-learning-of-teachers-and-school-leaders.pdf?sfvrsn=6f7eff3c_4

Australian Institute for Teaching and School Leadership (AITSL). (n.d.). *Professional learning communities.* https://www.aitsl.edu.au/docs/default-source/feedback/aitsl-professional-learning-communities-strategy.pdf

Australian Institute for Teaching and School Leadership (AITSL). (n.d.). *User guide to feedback implementation resources*. https://www.aitsl.edu.au/teach/improve-practice/feedback

Bailey, R. (2001) Overcoming vermiphobia—learning to love truth again. *British Journal of Educational Studies, 49*(2), 159–172.

Baker, B. & Stanley, L. S. (1994) *Issues in culturally responsive teacher education*, [Paper presentation]. The Madison Area Action Research Network Conference, Madison, WI, United States.

Barab, S., & Duffy, T. (2000). From practice fields to communities of practice. In D. Jonassen & S. Land (Ed.), *Theoretical foundations of learning environments* (pp. 25-56). Lawrence Erlbaum Associates.

Barab, S. A., & Duffy, T. M. (2000). From practice fields to communities of practice. In D. H. Jonassen, & S. M. Land (Eds.), *Theoretical foundations of learning environments* (pp. 25–55). Erlbaum.

Barrett, K. R., & Turner, A. P. (2000). Sandy's challenge: New game, new paradigm (a correspondence). *Journal of Teaching in Physical Education 19*, (2), 162–81.

Baxter, D. & Dudley, D. (2007). *Assessing for deeper understanding in tertiary examinations in physical education using a SOLO taxonomy*, 1–9.

Bechtel, P. A., & O'Sullivan, M. O. (2006). Chapter 2: Effective professional development — What we now know calls for professional development. *Journal of Teaching in Physical Education*, *25*, 363–378.

Bechtel, P. A., & Sullivan, M. O. (2007). Enhancers and inhibitors of teacher change among secondary physical educators. *Journal of Teaching in Physical Education*, *26*, 221–235.

Behets, D., & Vergauwen, L. (2006). Learning to teach in the field. In: D. Kirk, D. Macdonald & M. O'Sullivan (Ed.), *The handbook of physical education* (pp. 407-424). SAGE.

Belenger, D. N., Bernhardt, K. L., & Goldstucker, J. L. (1976). Qualitative research techniques: Focus group interviews. In Hayes, T. J. & Tathum, C. B. (Eds.) (1989). *Focus group interviews: A reader* (2nd ed.). American Marketing Association.

Birman, B. F., Desimone, L., Porter, A., & Garet, M. (2000). Designing professional development that works. *Educational Leadership*, *57*(8), 28-33.

Bodner, G. M. & MacIsaac, D. L. (1995, April 22-25). *A critical examination of relevance in science education research.* [Paper presentation]. Annual Meeting of the National Association for Research in Science Teaching, San Francisco, California, United States.

Bogdan, R. & Biklen, S. (1992). *Qualitative research for education: An introduction to theory and methods* (3rd ed.). Pearson.

Bolam, R. (1999). *The emerging conceptualisation of INSET: does this constitute professional development?,* paper presented at the Standing Committee for the Education and Training of Teachers: Teacher Professionalism and the State in the 21st Century, Annual Conference, Rugby, 26–28 November

Borko, H. (2004). Professional development and teacher learning: Mapping the terrain. *Educational Researcher*, *33*(8), 3–15.

Borko, H., & Putnam, R. (1995). Expanding a teachers' knowledge base: A cognitive psychological perspective on professional development. In T. Guskey & M. Huberman (Eds.), *Professional development in education: New paradigms and practice* (pp. 35–66). New York: Teachers College Press.

Bowes, M., & Tinning R. (2015). Productive pedagogies and teachers' professional learning in physical education, *Asia-Pacific Journal of Health, Sport and Physical Education*, *6*(1), 93-109, https://doi.org/10.1080/18377122.2014.997863

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology, 3*, 77–101. https://doi.org/10.1191/1478088706qp063oa

Brooker, R., Kirk, D., Braiuka, S., & Bransgrove, A. (2000). Implementing a game sense approach to teaching junior high school basketball in a naturalistic setting. *European Physical Education Review*, *6*(1), 7–26. https://doi.org/10.1177/1356336X000061003

Brooker, R., Kirk, D., Braiuka, S., & Bransgrove, A. (2000). Implementing a games sense approach to teaching junior high school basketball in a naturalistic setting. *European Physical Education Review*, *6*(1), 7–26.

Brown, S., & Hopper, T. (2006). Can all students in physical education get an 'A'? Game performance assessment by peers as a critical component of student learning. *Physical and Health Education*, Spring 2006, 13- 21.

Brown, T. D. (2011). More than glimpses in the mirror: An argument for self-study in the professional learning of physical education teachers. *Asia-Pacific Journal of Health, Sport and Physical Education, 2*(1), 19-32.

Brown, T. (2018). Lifelong Learning: An organising principle for reform. *Australian Journal of Adult Learning*. 58(3). 314-337.

Bunker, D., & Thorpe. R. (1982). A model for the teaching of games in secondary schools. *Bulletin of Physical Education, 18*(1), 5–8.

Bunker, D., & Thorpe, R. (1986a). The curriculum model. In R. Thorpe, D. Bunker & L. Almond (Ed.), *Rethinking games teaching* (pp. 7-10). Department of Physical Education and Sport Science, University of Technology, Loughborough.

Bunker, D., & Thorpe, R. (1986b). From theory to practice. In R. Thorpe, D. Bunker & L. Almond (Ed.), *Rethinking games teaching* (pp. 11-16). Department of Physical Education and Sport Science, University of Technology, Loughborough.

Burbank, M. D., & Kauchak, D. (2003). An alternative model for professional development: Investigations into effective collaboration. *Teaching and Teacher Education, 19*(5), 499-514.

Burkholder, G, J., Cox, K, A., Crawford, L, M., & Hitchcock, J, H. (2019). *Research Design and Methods*. Sage Publications.

Burkholder, G. J., Cox, K. A., Crawford, L. M., & Hitchcock, J. H. (2019). *Research design and methods*. SAGE publications.

Burns, R. (2000). *Introduction to research methods* (4th ed.). Longman.

Butler, D. L., Lauscher, H. N., Jarvis-Selinger, S., & Beckingham, B. (2004). Collaboration and self-regulation in teachers' professional development. *Teaching and Teacher Education*, 20, 435–455.

Butler, D. L., Lauscher, H. N., Jarvis-Selinger, S., & Beckingham, B. (2004). Collaboration and self-regulation in teachers' professional development. *Teaching and Teacher Education*, *20*(5), 435–455. https://doi.org/10.1016/j.tate.2004.04.003

Butler, J. (1993) Teacher change in sport education, Dissertation Abstracts International, 54 02A. (UMI No. 9318198).

Butler, J. (1996). Teacher responses to teaching games for understanding. *Journal of Physical Education, Recreation & Dance*, *67*(9), 17–20.

Butler, J. I. (1996). Teacher responses to teaching games for understanding. *Journal of Physical Education, Recreation & Dance, 67*(9), 17-20.

Butler, J. (1997). How would Socrates teach games? A constructivist approach. *Journal of Physical Education, Recreation & Dance*, *68*(9), 42–47.

Butler, J.I. (2005). TGfU and pet-agogy: Old dogs, new tricks and puppy school. *Physical Education & Sport Pedagogy, 10*(3), 225–40.

Butler, J. I. (2006). Curriculum constructions of ability: enhancing learning through Teaching Games for Understanding (TGfU) as a curriculum model. *Sport, Education and Society, 11*(3), 243-258. https://doi.org/10.1080/13573320600813408

Cameron, J., Mercier, K., & Doolittle, S. (2016). Teacher-led change in secondary school physical education. *The Physical Educator*, *73*(1), 32–58. https://doi.org/10.18666/tpe-2016-v73-i1-5741

Carr, W., & Kemmis, S. (1986). *Becoming critical: Education, Knowledge and Action Research*. Falmer.

Casey, A. (2010). Educational action research: A means of coping with the systemic demands for continual professional development in physical education? [Paper presentation]. British Educational Research Association Conference, Warwick, England.

Casey, A. (2012a). Practitioner research: A means of coping with the systemic demands for continual professional development? *European Physical Education Review*, *19*(1), 76–90. https://doi.org/10.1177/1356336X12465510

Casey, A. (2012b). A self-study using action research: changing site expectations and practice stereotypes. *Educational Action Research*, *20*(2), 219–232. https://doi.org/10.1080/09650792.2012.676287

Casey, A., & Dyson, B. (2009). "The implementation of models-based practice in physical education through action research." *European Physical Education Review*, 15(2), 175–199.

Casey, A., and Dyson, B. (2009a). "The implementation of models-based practice in physical education through action research." *European Physical Education Review, 15*(2), 175–199.

Casey, A., Dyson, B., & Campbell, A. (2009b). Action research in physical education: focusing beyond myself through cooperative learning. *Educational Action Research*, *17*(3), 407–423. https://doi.org/10.1080/09650790903093508

Cazden, C. B. (2001). *Classroom discourse: The language of teaching and learning* (2nd ed.). Heinemann.

Chand, P. (2000). *Continuing education in India*. *Indian Journal of Adult Education*. 61 (3).

Chandler, T. (1996). Teaching Games for Understanding. Reflections and further questions. *Journal of Physical Education, Recreation & Dance*; *Apr 1996, 67*(4); ProQuest Central pg. 49.

Chang, L. C., & Lee, G. C. (2010). A team-teaching model for practicing project-based learning in high school: Collaboration between computer and subject teachers. *Computers & Education, 55*(3), 961-969.

Chou, C. (2011). Teachers' professional development: Investigating teachers' learning to do action research in a professional learning community. *Asia-Pacific Education Researcher, 20*, 1.

Chow, J. Y., Davids, K., Button, C., Shuttleworth, R., Renshaw, I., & Araújo, D. (2016). The role of nonlinear pedagogy in physical education. *Review of Educational Research, 77*(3), 251-278.

Clark, K., & Borko, H. (2004). Establishing a professional learning community among middle school mathematics teachers. In M. J. Hoines and A. Fuglestad (Ed.), *Proceedings of the 28th conference of the International Group for the Psychology of Mathematics Education* (Vol. 2, pp. 223–230). Bergen University College.

Clarke, D. J., & Hollingsworth, H. (1994). Reconceptualising teacher change. In G. Bell, B. Wright, N. Leeson, & J. Geake (Ed.), *Challenges in mathematics education: Constraints on construction, Vol. 1. Proceedings of the 17th annual conference of the Mathematics Education Research Group of Australasia* (pp. 153–164). Southern Cross University.

Clarke, D. J., & Peter, A. (1993). Modelling teacher change. In B. Atweh, C. Kanes, M. Carss, & G. Booker (Ed.), *Contexts in mathematics education. Proceedings of the 16th annual conference of the Mathematics Education Research Group of Australasia* (MERGA). Mathematics Education Research Group of Australasia.

Clarke, D. J. (1998). Studying the classroom negotiation of meaning: Complementary accounts methodology. In A. Teppo (Ed.), *Qualitative research methods in*

mathematics education (pp. 98–111). Monograph Number 9 of the Journal for Research in Mathematics Education. NCTM. ISBN 0-87353-459-X

Cobb, P., McClain, K., de Silva Lamberg, T., & Dean, C. (2003). Situating teachers' instructional practices in the institutional setting of the school and district. *Educational Researcher*, *32*(6), 13–24. https://doi.org/10.3102/0013189X032006013

Cobb, P., Wood, T., & Yackel, E. (1990). Classrooms as learning environments for teachers and researchers. In R. B. Davis, C. A. Mayer, & N. Noddings (Ed.), *Constructivist views on the teaching and learning of mathematics* (pp. 125–146). National Council of Teachers of Mathematics.

Cochran-Smith, M., & Lytle, S. (1993). *Inside/outside: Teacher research and knowledge*. Teachers College Press.

Cochran-Smith, M., & Lytle, S. L. (1999). Relationships of knowledge and practice: Teacher learning in communities. *Review of Research in Education,* 24(1999), 249-305. http://www.jstor.org/stable/1167272

Cole, P. (2004, December). *Professional Development: A great way to avoid change*. IARTV. Dec 2004 Seminar Series No 140. Jolimont, Vic, Australia.

Collins, L. 2017, 'Quality teaching in our schools', Scan, 36(4), pp. 29-33. https://education.nsw.gov.au/teaching-and-learning/professional-learning/scan/past-issues/vol-36--2017/quality-teaching-in-our-schools

Corcoran, T.C. (1995) *Transforming professional development for teachers: A guide of state policy- makers*. National Governors' Association.

Cordingley P., Bell, M., Thomason, S., & Firth, A. (2005). *The impact of collaborative continuing pro- fessional development (CPD) on classroom teaching and learning. Review: How do collaborative and sustained CPD and sustained but not collaborative CPD affect teaching and learning?* EPPI Centre. http://eppi.ioe.ac.uk/cms/Default.aspx?tabid=136 (accessed October 5, 2011).

Çorlu, M. A., & Çorlu, M. S. (2012). Scientific inquiry based professional development models in teacher education. *Educational Sciences: Theory & Practice, 12*, 514–521.

Çorlu, M.A., Niğdelioğlu, R., & Kaymak, K. (2008, March). *Development of experimental design and research based inquiry skills of prospective physics teachers*. [Paper presentation]. National Science Teachers Association (NSTA) International Conference, Boston, MA, United States.

Çorlu, M.A. (2005). Bilimsel sorgulamalı ders tasarımı ve yö- netimi [Özel Sayı]. *Buca Eğitim Fakültesi Dergisi, 17*, 265-271.

Cothran, D. J. (2001). Curricular change in physical education: Success stories from the front line. *Sport, Education and Society*, *6*(1), 67–79. https://doi.org/10.1080/713696038

Cothran, D. J. (2001) Curricular change in physical education: Success stories from the front line, *Sport, Education and Society, 6*(1), 67-79, https://doi.org/10.1080/713696038

Cotton, K. (2001). Classroom Questioning. School Improvement Research Series. Research you can use. Retrieved October 26, 2014, from School improvement research series.

Coulter, M., & Woods, C. B. (2012). Primary teachers' experience of a physical education professional development programme. *Irish Educational Studies*, *31*(3), 329–343. https://doi.org/10.1080/03323315.2012.710062

Cowan, D'E., Fleming, G. L., Thompson, T. L. & Morrisey, M. S. (2004). Study description: Investigating five PLC schools. In S. M. Hord (ed.), *Learning together, leading together: Changing schools through professional learning communities*. Teachers College Press.

Crawford, L, M. (2019). Conceptual and theoretical frameworks. In G. J. Burkholder, K. A. Cox, L. M. Crawford, & J. H. Hitchcock, *Research design and methods*. Sage Publications.

Creswell, J. (2007). *Qualitative inquiry and research design: Choosing among five approaches*. Sage.

Crockett, M. D. (2002). Inquiry as professional development: Creating dilemmas through teachers' work. *Teaching and Teacher Education, 18*(5), 609-624.

Crockett, M. D. (2002). Inquiry as professional development: Creating dilemmas through teachers' work. *Teaching and Teacher Education*, *18*(5), 609–624. https://doi.org/10.1016/S0742-051X(02)00019-7

Cruz, A., Li, C., & Kam, W. K. K. (2012). Learning to implement teaching games for understanding during teaching practice. *Asian Journal of Physical Education & Recreation, 18*(1).

Curry, C. (2012). Why public primary schools need specialist PE teachers. *Active & Healthy Magazine*, *19*(2).

Curry, C., & Light, R. (2007). Addressing the NSW quality teaching framework in physical education: Is game sense the answer? *Proceedings of the Asia Pacific Conference on Teaching Sport and Physical Education for Understanding* (pp. 7- 19). Sydney: The University of Sydney, Australia.

Darling-Hammond, L. (2000). Teacher quality and student achievement: A review of state policy evidence. *Education Policy Analysis Archives*. Vol. 8. No.1. P. 149.

Darling-Hammond, L. (2005). Teaching as a profession: Lessons in teacher preparation and professional development. *Phi Delta Kappan, 87*(3), 237-240.

Darling-Hammond, L., & McLaughlin, M. W. (2011). Policies that support professional development in an era of reform. *Phi Delta Kappan*, *92*(6), 81–92. https://doi.org/10.1177/003172171109200622

Davis, J. R. (1995). *Interdisciplinary courses and team teaching: New arrangements for learning*. ACE/Oryx. Also retrieved on 11/17/08: athttps://www.ntlf.com/html/lib/ictt_xrpt.htm.

Day, C. (2000) Teachers in the twenty-first century: time to renew the vision. *Teachers and Teaching: Theory and Practice, 6*(1), 101–115.

Day, C. (2002). The challenge to be the best: Reckless curiosity and mischievous motivation. *Teachers and Teaching: Theory and Practice*, *8*(3), 421–434. https://doi.org/10.1080/135406002100000549

Day, C. (2004). Change agendas: the roles of teacher educators. *Teaching Education*, *15*(2), 145–158. https://doi.org/10.1080/1047621042000213584

Day, C., & Sachs, J. (2004). Professionalism, performativity and empowerment: Discourses in the politics, policies and purposes of CPD. In C. Day & J. Sachs (Ed.), *International handbook on the continuing professional development of teachers*, (pp. 3–32). Open University Press.

Deglau, D., Ward, P., O'Sullivan, M., & Bush, K. (2006). Chapter 5: Professional dialogue as professional development. *Journal of Teaching in Physical Education*, *25*(4), 413–427. https://doi.org/10.1123/jtpe.25.4.413

Denzin, N. K., & Lincoln, Y. S. (Ed.). (1994). *Handbook of qualitative research.* Sage.

Denzin, N. K., & Lincoln, Y. S. (2000). *The Sage handbook of qualitative research* (2nd ed.). Sage.

Desimone, L. M., Porter, A. C., Garet, M. S., Yoon, K. S., & Birman, B. F. (2002). Effects of professional development on teachers' instruction: Results from a three-year longitudinal study. *Educational Evaluation and Policy Analysis*, *24*(2), 81–112.

Desimone, L. M. (2009). Improving impact studies of teachers' professional development: Toward better conceptualizations and measures. *Educational Researcher*, *38*(3), 181–199. https://doi.org/10.3102/0013189X08331140

Dewey, J. (1910). *How we think*. D.C. Heath.

Dewey, J. (1933). *How we think: A restatement of the relations of reflective thinking to the educative process* (2nd rev. ed). D.C. Heath.

Dey, I. (1993). *Qualitative data analysis: A user friendly guide for social scientists*. Routledge.

Díaz-Cueto, M., Hernández-Álvarez, J., & Castejón, F. (2010). "Teaching games for understanding to in-service physical education teachers: Rewards and barriers regarding the changing model of teaching Sport." *Journal of Teaching in Physical Education, 29*(4), 378–398.

Díaz-Cueto, M., Hernández-Álvarez, J. L., & Castejón, F. J. (2010). Teaching games for understanding to in-service physical education teachers: Rewards and barriers regarding the changing model of teaching sport. *Journal of Teaching in Physical Education*, *29*, 378–398.

Dickson, D. (20). The focus group approach. In O. Hargie & Tourish, D. (Ed.). *Handbook of communication audits for organisations* (pp.85-103). Routledge.

Dix, M. (2012). The student-centred school. *National Institute for Student-Centred Education.* http://nisce.org/wp-content/uploads/2012/09/The-Student-Centered-School.pdf

Dudley, D., & Baxter, D. (2009). Assessing levels of student understanding in pre-service teachers using a two-cycle SOLO model. *Asia-Pacific Journal of Teacher Education*, *37*(3), 283–293. https://doi.org/10.1080/13598660903052282

Dudley, D., and Baxter, D. (2009). "Assessing levels of student understanding in pre-service teachers using a two-Cycle SOLO model." *Asia-Pacific Journal of Teacher Education, 37*(3), 283–293.

DuFour, R. (2004). What is a professional learning community? *Educational Leadership, 61*(8), 6-11.

DuFour, R. & Eaker, R. (1998). *Professional learning communities at work: Best practices for enhancing student achievement*. Solution Tree.

Duncombe, R., and K. M. Armour. 2004. "Collaborative Professional Learning: From Theory to Practice." Journal of In-Service Education 30 (1): 141–166. doi:10.1080/13674580400200230.

Duncombe, R., & Armour, K. (2005, September 15-17). The school as a community of practice for primary physical education: The myths and the reality. [Paper presentation]. British Educational Research Association Annual Conference, at the University of Glamorgan, Wales, United Kingdom.

Dye, J. F., Schatz, I. M., Rosenberg, B. A., & Coleman, S. T. (2000, January). Constant comparison method: A kaleidoscope of data. *The Qualitative Report, 4(1/2)*. http://www.nova.edu/ssss/QR

Dyson, B., Griffin, L., & Hastie, P. (2004). Sport education, tactical games, and cooperative learning: Theoretical and pedagogical considerations. *Quest, 56*, 226–240.

Dyson, B., Griffin, L. L., & Hastie, P. (2004). Sport education, tactical games, and cooperative learning: Theoretical and pedagogical considerations, *Quest, 56*(2), 226-240.

East, K. (2015). "A study of professional learning communities: Characteristics of implementation and perceived effectiveness in improvement schools in West Virginia" (2015). *Theses, Dissertations and Capstones*, Paper 937.

Eisner, E. (1992). Educational reform and the ecology of schooling. *Teachers College Record, 93*(4), 610–627.

Elliott, J. (1991) *Action research for educational change*. Open University Press.

Elliott, S. N., Kratochwill, T.R., Littlefield Cook, J. & Travers, J. (2000). *Educational psychology: Effective teaching, effective learning (3rd ed.)*. McGraw-Hill College.

Elmore, R. E. (2000). Building a New Structure for School Leadership. *Albert Shanker Institute.* http://www.shankerinstitute.org/Downloads/building.pdf

Elmore, R. E., & Burney, D. (1997). Investing in Teacher Learning: Staff Development and Instructional Improvement in Community School District #2, *National Commission on Teaching and America's Future and the Consortium for Policy Research in Education,* New York City.

Ennis, C. D., & Catherine, D. (1999). Creating a culturally relevant curriculum for disengaged girls. *Sport, Education and Society*, *4*(1), 31–49. https://doi.org/10.1080/1357332990040103

Ennis, C. D., Ross, J. & Chen, A. (1992). The role of value orientations in curricular decision making: A rationale for teachers' goals and expectations. *Research Quarterly for Exercise and Sport, 63,* 38-47.

Ermeling, B. A. (2010). Tracing the effects of teacher inquiry on classroom practice. *Teaching and Teacher Education*, *26*(3), 377–388. https://doi.org/10.1016/j.tate.2009.02.019

Ermeling, B. A. (2012). Improving teaching through continuous learning: The inquiry process John Wooden used to become coach of the century. *Quest*, *64*(3), 197–208. https://doi.org/10.1080/00336297.2012.693754

Ermeling, B. A. (2012). Improving teaching through continuous learning: The inquiry process John Wooden used to become coach of the century. *Quest (National Association for Kinesiology in Higher Education), 64*(3), 197-208.

Evans, J., & Light, R. (2007). Coach development through collaborative action research: A rugby coach's implementation of game sense pedagogy. *Asian Journal of Sports Science, 4*, 1–7.

Evans, J., & Light, R. (2008). Coach development through collaborative action research: A rugby coach's implementation of game sense. *Asian Journal of Exercise and Sports Science, 5*(1), 31–37.

Evans, J. (2006). "Elite rugby coaches' interpretation and use of game sense." *Asian Journal of Exercise and Sport Science, 3*(1): 17–24.

Fawcett, G. (1996, Winter). Moving another big desk. *Journal of Staff Development, 17*(1), 34-36.

Fernandez, C., Cannon, J., & Chokshi, S. (2003). A US-Japan lesson study collaboration reveals critical lenses for examining practice. *Teaching and Teacher Education*, *19*(2), 171–185. https://doi.org/10.1016/S0742-051X(02)00102-6

Festinger, L. (1957) *A theory of cognitive dissonance*. Row Peterson.

Fishman, B. J., Marx, R. W., Best, S., & Tal, R. T. (2003). Linking teacher and student learning to improve professional development in systemic reform. *Teaching and Teacher Education*, *19*(6), 643–658. https://doi.org/10.1016/S0742-051X(03)00059-3

Flick, U. (2009). *An introduction to qualitative research (4th ed.)*. Sage Publications Ltd.

Flyvbjerg, B. (2004) Five misunderstandings about case study research. In: C. Seale, G. Gobo, J. F. Gubrium & D. Silverman (Ed.), *Qualitative research practice,* (pp. 420-434). Sage.

Forrest, R., Lowe, R., Potts, M., & Poyser, C. (2019). Identifying the factors that influence teacher practice change in a single case study. *Educational Psychology in Practice, 35*(4), 395-410.

Forrest, G., Webb, P., & Pearson, P. (2006) *Games for understanding in pre-service teacher education: A 'game for outcome' approach for enhanced understanding of games.* [Paper presentation]. First Asia Pacific Sport in Education Conference. http://www.proflearn.edsw.usyd.edu.au/proceedings_resources/papers/Proceedings_TGfU - SLCM_06_AsiaPacificSport.pdf

Forrest, G. J., Wright, J., & Pearson, P. (2011). How do you do what you do? Examining the development of quality teaching in using GCA in PETE teachers. *Physical Education and Sport Pedagogy*, *17*(2), 145–156.

Fosnot, C. (2005) *Constructivism: Theory, perspectives and practice*. Teachers College Press.

Fosnot, C. T. (Ed.) (1996). *Constructivism: Theory, perspectives, and practice.* Teachers College Press.

Fosnot, C. T. (Ed.) (1996). *Constructivism: Theory, perspectives, and practice*. Teachers College Press.

Fosnot, C. T. & Perry, R. S. (2005) Constructivism: A psychological theory of learning, In: C. T. Fosnot (Ed.), *Constructivism: theory, perspectives and practice* (pp. 8-38). Teachers College Press.

Fox, R. (2001). Constructivism examined. *Oxford Review of Education, 27*(1), 23-35.

Franke, M. & Kazemi, E. (2001). Learning to teach mathematics: Focus on student thinking. *Theory into practice, 40*(2), 102-109.

Fry, J. M., Tan, C. W. K., McNeill, M., & Wright, S. (2010). Children's perspectives on conceptual games teaching: a value-adding experience. *Physical Education & Sport Pedagogy*, *15*(2), 139–158.

Fullan, M. (1992). *Successful school improvement: The implementation perspective and beyond.* Open University Press.

Fullan, M. (2001). *The new meaning of educational change (3rd ed.)*. Teachers College Press and Routledge Falmer.

Fullan, M. (2007). *The new meaning of educational change* (4th ed.). Teachers College Press.

Gall, M., & Vojtek, R. (1994). *Effective staff development: Six research-based models.* ERIC Clearinghouse, University of Oregon [ERIC No. EA025786].

Gallimore, R., Ermeling, B. A., Saunders, W. M., & Goldenberg, C. (2009). Moving the learning of teaching closer to practice: Teacher education implications of school-based inquiry teams. *Elementary School Journal, 109*(5), 537–553.

Gallwey, T. W. (1974). *The inner game of tennis: The classic guide to the mental side of peak performance*. Random House.

Garet, M. S., Porter, A. C., Desimone, L., & Birman, B. F. (2001). What makes professional development effective? Results from a national sample of teachers. *American Educational Research Journal*, *38*(4), 915–945.

Gay, L. R., & Airasian, P. (2000). *Educational research*. Prentice Hall.

George, J. M. & Lubben, F. (2002). Facilitating teachers' professional growth through their involvement in creating context-based materials in science. *International Journal of Educational Development*, 22(6), 659-672.

Glaser, B., & Strauss, A. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Aldine.

Glaser, B. G., & Strauss, A. L. (1967). *Discovery of grounded theory: Strategies for qualitative research*. Aldine Publications.

Gore, J. (1991) Practicing what we preach: action research and the supervision of student teachers, In: B. R. Tabachnick & K. Zeichner (Ed.), *Issues and practices in inquiry-oriented teacher education* (pp. 253–272). The Falmer Press.

Gould, J, S. (2005). A constructivist perspective on teaching and learning in the language arts. In: C. T. Fosnot (Ed.), *Constructivism: theory, perspectives and practice* (pp. 8-38). Teachers College Press.

Gould, M. (2008). Teacher as researcher: A paradigm for professional development. *Kappa Delta Pi Record, 45*(1), 5-7.

Gould, M. (2008). Teacher as researcher: A paradigm for professional development. *Kappa Delta Pi Record, 45*(1), 5-7.

Gratton, C., & Jones, I. (2004). *Research methods for sport studies*. Routledge.

Gratton, C., & Jones, I. (2010). *Research methods for sports studies*. Routledge.

Greco, P., Memmert, D., & Morales, J, C, P. (2010). "The effect of deliberate play on tactical performance in basketball." *Perceptual and Motor Skills, 110*, 849–856.

Greenwald, R., Hedges, L, V., & Laine, R,D. (1996). The Effect of School Resources on Student Achievement. *Review of Educational Research. Vol.* 66.3. P. 361-96.

Gréhaigne, J. F., Richard, J. F., & Griffin, L. (2005). *Teaching and learning team sports and games.* Routledge Falmer.

Gréhaigne, J. F., Godbout, P., & Bouthier, D. (1997). Performance assessment in team sports. *Journal of Teaching in Physical Education, 16*(4), 500-516.

Gréhaigne, J. F., Godbout, P., & Bouthier, D. (1999). The foundation of tactics and strategy in team sports. *Journal of Teaching in Physical Education, 18*(2), 159-174.

Gréhaigne, J. F., Godbout, P., & Bouthier, D. (1999). The foundations of tactics and strategy in team sports. *Journal of Teaching in Physical Education*, *18*(2), 159–174. https://doi.org/10.1123/jtpe.18.2.159

Gréhaigne, J. F., Richard, J. F., & Griffin, L. (2005). *Teaching and learning team sports and games.* Routledge Falmer.

Griffin, L., and Butler, J. (2005) *Teaching games for understanding. Theory, research and practice.* Human Kinetics.

Griffin, L., Dodds, P., & Rovegno, I. (1996). Pedagogical content knowledge for teachers: Integrate everything you know to help students learn. *Journal of Physical Education, Recreation & Dance, 67*(9), 58-61.

Griffin, L., Mitchell, S., & Oslin, J. (1997). *Teaching sport concepts and skills: A tactical approach.* Human Kinetics.

Griffin, L.L., Brooker, R., & Patton, K. (2005). Working towards legitimacy: Two decades of teaching games for understanding. *Physical Education and Sport Pedagogy, 10*(3), 213–23.

Grimmett, P. R., Mackinnon, A. M., Erickson, G. L. & Riecken, T. J. (1990) Reflective practice in teacher education. In: R. T. Clift, W. R. Houston, & M. C. Pugach (Ed.), *Encouraging reflective practice in education: An analysis of issues and programs* (pp. 20-38). Teachers' College Press.

Groundwater-Smith, S., & Sachs, J. (2002). The activist professional and the reinstatement of trust. *Cambridge Journal of Education, 32*(3), 341-358.

Guba, E. G. (1996) Foreword, in: E. Stringer, Action research: a handbook for practitioners (London, Sage), ix–xiii.

Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In N. K. Denzin & Y. S. Lincoln (Ed.), *Handbook of qualitative research* (pp. 105–117). Sage Publications, Inc.

Gubacs-Collins, K. (2007). Implementing a tactical approach through action research. *Physical Education & Sport Pedagogy*, *12*(2), 105–126. https://doi.org/10.1080/17408980701281987

Gurvitch, R., Blankenship, B., Metzler, M., & Lund, J. (2008). Student teachers' implementation of model-based instruction: Facilitators and inhibitors. *Journal of Teaching in Physical Education, 2008; 27*(4): 466-86.

Guskey, T. R. (1986). Staff development and the process of teacher change. *Educational Researcher, 15*(5), 5–12.

Guskey, T. R. (2000). *Evaluating professional development.* Corwin Press.

Guskey, T. R. (2002). Professional development and teacher change. *Teachers and Teaching: Theory and Practice*, *8*(3), 381–391. https://doi.org/10.1080/135406002100000512

Guskey, T. R. (2003). What makes professional development effective? *ProQuest*, 748–750.

Guskey, T. R., & Huberman M. (Ed.) (1995). *Professional development in education: New paradigms and practice* (pp. 35–66). Teachers College Press.

Guskey, T., & Yoon, K. (2009). What works in professional development? *The Phi Delta Kappan*, *90*(7), 495–500.

Hammersley, M. (1992). *What's wrong with ethnography? Methodological explorations.* Routledge.

Hanks, W.F. (1991) Foreword. In J. Lave & E. Wenger (Ed.) *Situated learning. Legitimate peripheral participation*. Cambridge University Press.

Hanushek, A., E. (2005). *Economic outcomes and school quality.* International Institute for Educational Planning.

Hargreaves, A. (1994). *Changing teachers, changing times: Teachers' work and culture in the postmodern age*. Teachers College Press.

Hargreaves, A. (1996). Transforming knowledge: Blurring the boundaries between research, policy, and practice. *Educational Evaluation and Policy Analysis, 18*, 161-178.

Hargreaves, D. H. (1996) *Teaching as a research-based profession: possibilities and prospects, Teacher Training Agency Annual Lecture 1996.* Teacher Training Agency.

Hargreaves, D. H. (2012). *A self-improving school system: towards maturity.* National College for School Leadership. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/325908/a-self-improving-school-system-towards-maturity.pdf

Hargreaves, A., & Fink, D. (2006). Redistributed leadership for sustainable professional learning communities. *Journal of School Leadership, 16*(5), 550–565. https://doi.org/10.1177/105268460601600507

Hargreaves, A., & Fullan, M. (2012). *Professional capital: Transforming teaching in every school.* Routledge.

Hargreaves, A., & Fullan, M. G. (1991). *Understanding teacher development*. Cassell.

Harvey, S., & Jarrett, K. (2013). A review of the game-centred approaches to teaching and coaching literature since 2006. *Physical Education & Sport Pedagogy*, *19*(3), 1–23. https://doi.org/10.1080/17408989.2012.754005

Harvey, S., & Jarrett, K. (2014). A review of the game-centred approaches to teaching and coaching literature since 2006. *Physical Education and Sport Pedagogy*, *19*(3), 278–300. https://doi.org/10.1080/17408989.2012.754005

Harvey, S., & Light, R. L. (2015). Questioning for learning in game-based approaches to teaching and coaching. *Asia-Pacific Journal of Health, Sport and Physical Education*, *6*(2), 175–190.

Harvey, S., & Robertson, D. (2017). An investigation into moderate to vigorous and vigorous physical activity accrual during invasion and net-wall game-focused tactical games model lessons. *European Journal of Physical Education and Sport Science*, *3*(6), 1–21.

Harvey, S., Cope, E., & Jones, R. (2016). Developing questioning in game-centered approaches. *Journal of Physical Education, Recreation & Dance, 87*(3), 28-35.

Harvey, S., Cushion, C., & Massa-Gonzalez, A. (2010). "Learning a new method: Teaching games for understanding in the coaches' eyes." *Physical Education and Sport Pedagogy, 15*(4), 361–382.

Harvey, S., Cushion, C., Wegis, H., & Massa-Gonzalez A. (2010). "Teaching games for understanding in American high-school soccer: A quantitative data analysis using the game performance assessment instrument." *Physical Education and Sport Pedagogy, 15*(1), 29–54.

Harvey, S., Gil-Arias, A., Smith, M. L., & Smith, L. R. (2017). Middle and elementary school students' changes in self-determined motivation in a basketball unit taught using the tactical games model. *Journal of Human Kinetics, 59*(1), 39-53.

Harvey, S. (2009). "A study of interscholastic soccer players perceptions of learning with game sense." *Asian Journal of Exercise and Sports Science, 6*(1), 1–10.

Hastie, P., & Casey, A. (2014). Fidelity in models-based practice research in sport pedagogy: A guide for future investigations. *Journal of Teaching in Physical Education. 2014, 33*, 422-431. http://dx.doi.org/10.1123/jtpe.2013-0141

Hastie, P., & Curtner-Smith, M. (2006). "Influence of a hybrid sport education – teaching games for understanding unit on one teacher and his students." *Physical Education and Sport Pedagogy, 11*(1), 1–27

Hastie, P. A., & Curtner-Smith, M. D. (2006). Influence of a hybrid sport education—Teaching Games for Understanding unit on one teacher and his students. *Physical Education & Sport Pedagogy*, *11*(1), 1–27. https://doi.org/10.1080/17408980500466813

Hastie, P.A. & Curtner-Smith, M. D. (2006). Influence of a hybrid sport education – teaching games for understanding unit on one teacher and his students. *Physical Education and Sport Pedagogy. 11*(1), 1-27.

Hattie, J., and Timperley, H. (2007). The power of feedback. *Rev. Educ. Res., 77*, 81–112. https://doi.org/10.3102/003465430298487

Hawley, W., & Rollie, D. L. (Ed.) (2007). *The keys to effective schools: Educational reform as continuous improvement* (2nd ed.). Corwin Press. http://dx.doi.org/10.4135/9781483329512

Hawley, W., & Valli, L. (1999). The essentials of effective professional development: A new consensus. *Teaching as the Learning Profession: Handbook of Policy and Practice*, L Darlins-Hammond, L, & Sykes, G. (eds). Jossey Bass, San Francisco, p. 151–80.

Hayes, D., Mills, M., Christie, P. & Lingard, B. (2006). *Teachers and schooling making a difference: Productive pedagogies, assessment and performance*. Allen & Unwin.

Helsing, D., & Lemons. R. W. (2008). Leadership practice communities: Improving teaching and learning. *Leadership, 38*(1), 14.

Hoban, G. F. (2002). *Teacher learning for educational change.* Buckingham: Open University Press.

Hoban, G. F. & Erickson, G. (2004) Dimensions of learning for long-term professional develop- ment: comparing approaches from education, business, and medical contexts, *Journal of In- service Education*, 30, 301–324.

Hodkinson, P., & Hodkinson, H. (2003). Individuals, communities of practice and policy context: School teachers' learning in their workplace. *Studies Continuing Educ, 25*(1) 3-21.

Hodkinson, P., & Hodkinson, H. (2003). Individuals, communities of practice and policy context: School teachers' learning in their workplace. *Studies Continuing Educ, 25*(1) 3-21.

Holton, J.A. (2007). "The coding process and its challenges,". In A. Bryant and K. Charmaz (Ed.) *The SAGE handbook of grounded theory* (pp. 265-290) SAGE.

Hopper, T. (1996). *Learning to teach games for understanding: Coming to know the action research process.* Research Gate.

Hopper, T., Butler, J. I., & Storey, B. (Eds.) (2009). *TGfU...Simply good pedagogy: understanding a complex challenge.* Toronto: HPE Canada.

Hord, S. (2004). Professional learning communities: An overview. In S. Hord (ed.), *Learning together, leading together: Changing schools through professional learning communities.* Teachers College Press.

Hord, S.M. (1997). *Professional learning communities: Communities of continuous inquiry and improvement.* Southwest Educational Development Laboratory.

Howarth, K. (2005). Introducing the teaching games for understanding model in teacher education programs. In: L. Griffin and J. Butler (Ed.), *Teaching games for understanding: Theory, research and practice*. (pp. 91-106). Human Kinetics.

Howarth, K. 2005. Introducing the teaching games for understanding model in teacher education programmes. In L. Griffin, and J. Butler (Ed.), *Teaching games for understanding: Theory, research and practice* (pp. 91–105). Human Kinetics.

Huberman, M. (1993). *The lives of teachers.* Teachers College Press.

Huff, A. S. (2009). *Designing research for publication*. Sage.

Hunzicker, J. (2011). Effective professional development for teachers: A checklist. *Professional Development in Education*, *37*(2), 177–179. https://doi.org/10.1080/19415257.2010.523955

Hussey, J. & Hussey, R. (1997), *Business research*. Basingstoke.

Jang, H. (2008). Supporting students' motivation, engagement, and learning during an uninteresting activity. *Journal of Educational Psychology, 100,* 798-811. http://dx.doi.org/10.1037/a0012841

Jang, S. J. (2006b). Research on the effects of team teaching upon two secondary school teachers. *Educational Research, 48*(2), 177–194.

Jarrett, K. (2011). "Undergraduate sport students' perceptions of a change to game sense pedagogy." *Asian Journal of Exercise and Sport Science, 4*(1): 1–17.

Jarrett, K. and Harvey, S. (2016). Similar, but not the same: Comparing the game based approaches of Teaching Games for Understanding (TGfU) and Game Sense, *eJRIEPS, 38,* Online since 01 April 2016, connection on 01 August 2019. http://journals.openedition.org/ejrieps/900, https://doi.org/10.4000/ejrieps.900

Johnson, A. P. (2005). *A short guide to action research* (2nd ed.). Allyn & Bacon.

Jackson, S., Jones, D., & Williamson, T. (1983). It's a different ball game: A critical look at the games curriculum. In Spackman, L. (Ed.). Teaching Games for Understanding (pp.21-24). Cheltenham, England: The College of St. Paul and St, Mary, Curriculum Development Centre.

Kagan, S. (2005). Rethinking thinking. Does Bloom's taxonomy align with brain science? *Kagan Online Magazine*, *8*(3). www.KaganOnline.com

Keay, J. (2005). Developing the physical education profession: New teachers learning within a subject-based community, (May 2015), 37–41. https://doi.org/10.1080/17408980500105031

Keay, J. (2006). “Collaborative Learning in Physical Education Teachers’ Early-career Professional Development.” Physical Education and Sport Pedagogy 11 (3): 285–305. doi:10.1080/17408980600986322.

Kemmis, S. (2009). Action research as a practice-based practice. *Educational Action Research, 17*(3), 463-474.

Kemmis, S. & McTaggart, R. (1988). *The action research planner* (3rd ed.). Deakin University.

Kennedy, M. (1999). Form and substance in inservice teacher education. *Research Monograph No. 13*

Kern, B. D., & Graber, K. C. (2017). Physical education teacher change: Initial validation of the teacher change questionnaire - physical education. *Measurement in Physical Education and Exercise Science*, *21*(3), 161–173. https://doi.org/10.1080/1091367X.2017.1319371

Kern, B. D., & Graber, K. C. (2018). Understanding Teacher Change: A National Survey of U.S. *Physical Educators, Research Quarterly for Exercise and Sport*, 89:1, 80-90, DOI: 10.1080/02701367.2017.1411579

Kidman, L. (2001). *Developing decision makers. An empowerment approach to coaching*. Innovative Print Communication.

Kirk, D., & Macdonald, D. (1998). Situated learning in physical education. *Journal of Teaching in Physical Education, 17*(3), 376-387.

Kirk, D., & Macdonald, D. (1998). Situating learning in physical education. *Journal of Teaching in Physical Education*, (17), 376–387.

Kirk, D., & MacPhail, A. (2002). Teaching games for understanding and situated learning: Re-thinking the Bunker-Thorpe model. *Journal of Teaching in Physical Education, 21*, 177–92.

Kirk, D. (1983) Theoretical guidelines for thinking about games, *Bulletin of Physical Education, 19*(1), 41–45.

Kirk, D. (1995). Action research and educational reform in physical education. *Pedagogy in Practice*, *1*, 4–21.

Kirk, D. (2003). Guest editorial. *European Physical Education Review, 9*(3), 219.

Kirk, D. (2005). "Future prospects for teaching games for understanding." In L. Griffin & J. Butler (Ed.), *Teaching games for understanding: Theory, research and practice* (pp. 209–223). Human Kinetics.

Kirk, D. (2010). *Physical education futures.* Routledge.

Knight, P. (2002). A systemic approach to professional development: learning as practice. *Teaching and Teacher Education*, *18*(3), 229–241. https://doi.org/10.1016/S0742-051X(01)00066-X

Koliba, C., & Gajda, R. (2009). "Communities of practice" as an analytical construct: Implications for theory and practice. *International Journal of Public Administration, 32*(2), 97-135.

Korstjens, I., & Moser, A. (2018). Series: Practical guidance to qualitative research. Part 4: Trustworthiness and publishing, *European Journal of General Practice, 24*(1), 120-124, https://doi.org/10.1080/13814788.2017.1375092

Kostina, L. (2015). Teacher Professional Development Strategies in Australian Government and Professional Association Documents. *Comparative Professional Pedagogy* 5(1)/2015

Kracl, C. L. (2012). Review or true? Using higher-level thinking questions in social studies instruction. *The Social Studies, 103*, 57–60. https://doi.org/10.1080/00377996.2011.586382

Kralik, D. (2000). *The Quest for ordinariness: Midlife women living through chronic illness* [PhD thesis]. Flinders University, Adelaide.

Kuehl-Kitchen, J. (2005). *Pre-service teachers' experiences in planning, implementing and assessing the tactical (TGfU) model*. [Doctoral thesis]. Tese de Doutoramento. Florida State University, Florida, United States.

Kwakman, K. (2003). Factors affecting teachers' participation in professional learning activities. *Teaching and Teacher Education, 19*(2), 149-170.

Launder, A. G. (2001). *Play practice: The games approach to teaching and coaching sports.* Human Kinetics.

Lave, J. (1996). Teaching, as learning, in practice. *Mind, Culture and Activity, 3*(3), 149-164.

Lave, J. & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge University Press.

Law, S. (1999). Leadership for learning: the changing culture of professional development in schools. *Journal of Education Administration, 37*(1), 66–80.

Lawson, H. A. (1991). Three perspectives on induction and a normative order for physical education. *Quest, 43*, 20–36.

Leask, M. (2001). Improving your teaching: an introduction to action research and reflective practice. In: S. Capel, M. Leask & T. Turner (Ed.), *Learning to teach in the secondary school: a companion to school experience* (pp. 278-285) Routledge.

Leitch, R., & Day, C. (2000). Action research and reflective practice: Towards a holistic view, *Educational Action Research, 8*(1), 179-193, https://doi.org/10.1080/09650790000200108

Lempert, J.A. (2007). "Asking questions of the data: Memo writing in the grounded theory tradition". In A. Bryant and K. Charmaz (Ed.), *The SAGE handbook of grounded theory* (pp. 265-290) SAGE.

Lewin, K. (1935). *A dynamic theory of personality.* McGraw Hill.

Lewin, K. (1946). Action research and minority problems. In G. W. Lewin (Ed.) *Resolving social conflicts*. Harper & Row.

Lewis, C., Perry, R., & Murata, A. (2006). How should research contribute to instructional improvement? The case of lesson study. *Educational Researcher*, *35*(3), 3–14. https://doi.org/10.3102/0013189X035003003

Light, R. (2002). Engaging the body in learning: promoting cognition in games through TgfU. *ACHPER Healthy Lifestyles Journal, 49*(2), 23-26.

Light, R. (2004). "Coaches' experiences of games sense: Opportunities and challenges." *Physical Education and Sport Pedagogy, 9*(2): 115–131.

Light, R. (2008). Complex learning theory – Its epistemology and its assumptions about learning: Implications for physical education. *Journal of Teaching in Physical Education*, *27*(1), 21–37.

Light, R. (2012). Game sense pedagogy in youth sport: An applied ethics perspective. In S. Harvey and R. Light (Ed.), *Ethics in youth sport: Policy and pedagogical applications* (pp. 92-106). Routledge.

Light, R. L. (2012). *Game sense: Pedagogy for performance, participation and enjoyment*. Routledge.

Light, R. (2013). *Game sense: Pedagogy for performance, participation and enjoyment*. Routledge.

Light, R. (2014). Quality teaching beyond games through game sense pedagogy. *Special Games Sense Edition 2014*, 1–13.

Light, R. (2014) Positive pedagogy for physical education and sport. In R. Light, J. Quay, S. Harvey & A. Mooney (Eds.), *Contemporary development in games teaching* (pp. 29-42). Routledge.

Light, R., & Fawns, R. (2003). Knowing the game: integrating speech and action in games teaching through TGfU. *Quest, 55*, 161-177.

Light, R., & Georgakis, S. (2005). Integrating theory and practice in teacher education: The impact of a games sense unit on female pre-service primary teachers' attitudes toward teaching physical education. *Journal of Physical Education New Zealand, 38*(1), 67-80.

Light, R., & Georgakis, S. (2007). The effect of game sense pedagogy on primary school pre-service teachers' attitudes to teaching physical education. *Australian Council for Health, Physical Education and Recreation Healthy Lifestyles Journal, 54*(1), 24–28.

Light, R., & Mooney, A. (2014). Introduction. In R. Light, J. Quay, S. Harvey, & A. Mooney (Eds.), *Contemporary developments in games teaching* (pp. 1-12). Routledge.

Light, R., Curry, C., & Mooney, A. (2014). Game sense as a model for delivering quality teaching in physical education. *Asia-Pacific Journal of Health, Sport & Physical Education, 5(*1), 67-81.

Light, R., Curry, C., & Mooney, A. (2014). Game sense as a model for delivering quality teaching in physical education. *Asia-Pacific Journal of Health, Sport and Physical Education, 5*, 67–81.

Light, R., Curry, C., & Mooney, A. (2014). Game sense as a model for delivering quality teaching in physical education. *Asia-Pacific Journal of Health, Sport and Physical Education*, *5*(1), 67–81. https://doi.org/10.1080/18377122.2014.868291

Light, R. & Tan, S. (2006). Culture, embodied experience and teachers' development of TGFU in Australia and Singapore. *European Physical Education Review, 12*(1), 99-117.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Sage Publications.

Lingard, B. & Ladwig, J. (2001). S*chool reform longitudinal study: Final report, vol.1*, Report prepared for Education Queensland by the School of Education, The University of Queensland.

Liston, D. P. & Zeichner, K. M. (1990) *Teacher education and the social conditions of schooling*. Routledge.

Little, J. W. (1987). Teachers as colleagues. In V. Richardson-Koehler (Ed.), *Educators' handbook: A research perspective* (pp. 491–518). Longman.

Little, J. W. (1990). The persistence of privacy: Autonomy and initiative in teachers' professional relations. *Teachers College Record, 91*(4), 509–536.

Little, J. W. (1993). Teachers' professional development in a climate of educational reform. *Education Evaluation and Policy Analysis*, *15*(2), 129–151.

Little J. W. (1990). The persistence of privacy autonomy and initiative in teachers' professional relations. *Teachers College Record, 91*(4), 509-535

Loughran, J. (2007). Researching teacher education practices: Responding to the challenges, demands and expectations of self study. *Journal of Teacher Education, 58*(1), 12-20.

Loughran, J. J. (2002). Understanding self-study of teacher education practices. In J. Loughran & T. Russell (Ed.), *Improving teacher education practices through self-study* (pp. 239-248). Routledge Falmer.

Loughran, J. J. (2004). History and context of self-Study of teaching. In J. Loughran, M. L. Hamilton, V. K. LaBoskey & T. L. Russell (Ed.), *International handbook of self study of teaching and teacher education practices* (pp. 7-39). Kluwer Academic Publishers.

Loughran, J. J. (2006). *Developing a pedagogy of teacher education: Understanding teaching and learning.*

Loughridge, M., & Tarantino, L. R. (2005). *Leading effective: Secondary school reform.* Corwin Press.

Louis, K.S., Kruse, S. & Bryk, A.S. (1995). Professionalism and community: What is it and why is it important in urban schools? In K. S. Louis, S. Kruse & Associates (1995), *Professionalism and community: Perspectives on reforming urban schools*. Corwin.

MacDonald, D., Kirk, D., & Braiuka, S. (1999). The social construction of the physical activity field at the school/university interface, *European Physical Education Review, 5*, 31-52.

MacLean, J., Mulholland, R., Gray, S., & Horrell, A. (2015) Enabling curriculum change in physical education: the interplay between policy constructors and practitioners. *Physical Education and Sport Pedagogy*. 20:1, 79-96, DOI: 10.1080/17408989.2013.798406

Macphail, A. (2011). Professional learning as a physical education teacher educator. *Physical Education and Sport Pedagogy*, *16*(4), 435–451. https://doi.org/10.1080/17408989.2011.582485

Makopoulou, K., & Armour, K. M. (2011a). Physical education teachers' career-long professional learning: Getting personal. *Sport, Education and Society*, *16*(5), 571–591. https://doi.org/10.1080/13573322.2011.601138

Makopoulou, K., & Armour, K. M. (2011b). Teachers' professional learning in a European learning society: The case of physical education. *Physical Education and Sport Pedagogy*, *16*(4), 417–433. https://doi.org/10.1080/13573322.2011.601138

Mandigo, J., Holt, N., Anderson, A., & Sheppard, J. (2008). Children's motivational experiences following autonomy-supportive games lessons. *European Physical Education Review*, *14*(3), 407–425. https://doi.org/10.1177/1356336X08095673

Mandigo, J., Holt, N., Anderson, A., & Sheppard, J. (2008). "Children's motivational experiences following autonomy-supportive games lessons." *European Physical Education Review. 14*(3), 407–425.

Martinek, T. & Butt, K. (1988). An application of an action research model for changing instructional practice, *Journal of Teaching in Physical Education, 7*, 214–220.

Mathew, P., Mathew, P,. & Peechattu, P. (2017). Reflective practices: A means to teacher development. *Asia Pacific Journal of Contemporary Education and Communication Technology (APJCECT), 3*(1). ISBN: 978 0 9943656 82; ISSN: 2205-6181 www.apiar.org.au

Maxwell, J. (2013). *Qualitative research design: An interactive approach* (3rd ed.). SAGE.

Mayer, D., Mitchell, J., Macdonald, D., Land, A., & Luke, A. (2003). *From personal reflection to professional community, Education Queensland, professional standards for teachers, evaluation of the 2002 pilot*. State of Queensland, Department of Education. http://education.qld.gov.au/learning/ldf/pdfs/standards/pilot-eval2002.pdf

Mayes, C. (2001) Deepening our reflectivity, *Teacher Educator*, *36*(4), 248–264.

McCaughtry, N., Sofo, S., Rovegno, I., & Curtner-Smith, M. (2004). Learning to teach sport education: Misunderstandings, pedagogical difficulties, and resistance. *European Physical Education Review, 10*(2), 135-155.

McDonough, A., Clarkson, P., & Scott, A. (2010). Teacher Change in Response to a Professional Learning Project. In L. Sparrow, B. Kissane, & C. Hurst (Eds.), *Shaping the future of mathematics education: Proceedings of the 33rd annual conference of the Mathematics Education Research Group of Australasia.* Fremantle: MERGA

McKernan, J. (1996). *Curriculum action research: A handbook of methods and resources for the reflection practitioner*. (2nd ed). Kogan Page Limited.

McLeod, S (2019). *What's the difference between qualitative and quantitative research?* https://www.simplypsychology.org/qualitative-quantitative.html

McMahon, M. (1997, December). Social constructivism and the world wide web - A paradigm for learning. [Paper presentation] The ASCILITE conference. Perth, Australia.

McMorris, T. (1998). Teaching games for understanding: Its contribution to the knowledge of skill acquisition from a motor learning perspective. *European Journal of Physical Education, 3,* 65-74.

McNeill, M., Fry, J. M., Wright, S., Tan, W. K., Tan, K.S., & Schempp, P. (2004). In the local context: Singaporean challenges to teaching games on practicum. *Sport, Education and Society 9*(1), 3–32.

McNeill, M. C., Fry, J. M., Wright, S. C., Tan, C. W. K., & Rossi, T. (2008). Structuring time and questioning to achieve tactical awareness in games lessons. *Physical Education & Sport Pedagogy*, *13*(3), 231–249. https://doi.org/10.1080/17408980701345766

McNeill, M. C., Fry, J. M., Wright, S. C., Tan, C. W. K., & Rossi, T. (2008). Structuring time and questioning to achieve tactical awareness in games lessons. *Physical Education and Sport Pedagogy, 13*, 231–249.

McNeill, M. C., Fry, J. M., Wright, S. C., Tan, W.K.C., Tan, K. S. S. & Schempp, P. G. (2004) In the local context': Singaporean challenges to teaching games on practicum, *Sport, Education and Society, 9*(1), 3-32.

McNiff, J., & Whitehead, J. (2009). *Doing and writing action research*. Sage.

McNiff, J. (1993) *Teaching as learning: an action research approach.* Routledge.

Memmert, D., & Harvey, S. (2008). The Game Performance Assessment Instrument (GPAI): Some concerns and solutions for further development. *Journal of Teaching in Physical Education, 27*(2), 220–240.

Memmert, D., & Harvey, S. (2010). Identification of non-specific tactical tasks in invasion games. *Physical Education & Sport Pedagogy*, *15*(3), 287–305. https://doi.org/10.1080/17408980903273121

Memmert, D., & Harvey, S. (2010). "Identification of non-specific tactical tasks in invasion games." *Physical Education and Sport Pedagogy, 15*(3), 287–385.

Memmert, D., & Roth, K. (2007). The effects of non-specific and specific concepts on tactical creativity in team ball sports. *Journal of Sports Sciences*, *25*(12), 1423–1432. https://doi.org/10.1080/02640410601129755

Memmert, D., & Roth, K. (2007). "The effects of non-specific and specific concepts on tactical creativity in team ball sports." *Journal of Sports Sciences, 25*(12), 1423–1432.

Memmert, D., Almond, L., Bunker, D., Butler, J., Fasold, F., Griffin, L., … Furley, P. (2015). Top 10 research questions related to teaching games for understanding. *Research Quarterly for Exercise and Sport*, *1367*(October), 1–13. https://doi.org/10.1080/02701367.2015.1087294

Memmert, D. (2006). "Developing creative thinking in a gifted sport enrichment program and the crucial role of attention processes." *High Ability Studies, 17*(1), 101–115.

Memmert, D. (2010). Testing of tactical performance in youth elite soccer. *Journal of Sports Science & Medicine, 9*(2), 199-205.

Memmert, D. (2007). "Can creativity be improved by an attention-broadening training program? – an exploratory study focusing on team sports." *Creativity Research Journal, 19*(2–3), 281– 291.

Mercier, K. & Doolittle, S. (2013). Assessing Student Achievement in Physical Education for Teacher Evaluation. *Journal of Physical Education, Recreation & Dance,84*(3), 38-42.

Metzler, M. (2017). *Instructional models in physical education*. Routledge

Metzler, M. W. (2005). *Instructional models for physical education* (2nd ed.). Holcomb Hathaway.

Miller, A., Eather, N., Gray, S., Sproule, J., Williams, C., Gore, J., & Lubans, D. (2017). Can continuing professional development utilizing a game-centred approach improve the quality of physical education teaching delivered by generalist primary school teachers? *European Physical Education Review, 23*(2), 171–195. https://doi.org/10.1177/1356336X16642716

Mills, M., Goos, M., Keddie, A., Honan, E., Pendergast, D., Gilbert, R., Nichols, K., Renshaw, P., Wright, T. (2009). Productive pedagogies: A redefined methodology for analysing quality teacher practice. *The Australian Educational Researcher*, *36*(3), 67–87. https://doi.org/10.1007/bf03216906

Ministerial Council on Education, Employment, Training and Youth Affairs Melbourne [MCEETYA]. (2008). Melbourne Declaration on Educational Goals for Young Australians. Melbourne, Victoria: MCEETYA

Mitchell, S. A. (2005). Teaching and learning games at the elementary level. In L. Griffin & J. Butler (Eds.), Teaching games for understanding: Theory, research and practice (pp. 55-70). Champaign. IL: Human Kinetics.

Mitchell, J. C. (2000) Case and situation analysis. In: R. Gomm, M. Hammersley & P. Foster (Eds) *Case study method* (pp. 165–186). SAGE.

Mitchell, S., Griffin, L. & Oslin, J. (1997) Teaching invasion games: a comparison of two instructional approaches, *Pedagogy in Practice, 3*(2), 56–69.

Mitchell, S., Oslin, J. & Griffin, L. (2006). *Teaching sport concepts and skills: A tactical games approach* (2nd ed.) Human Kinetics.

Mitchell, S., Oslin, J. & Griffin, L. L. (1995). The effects of two instructional approaches on game performance, *Pedagogy in Practice, 1*(1), 36–48

Mitchell, S. (2005). *Different paths up the same mountain: Global perspectives on Teaching Games for Understanding*. [Presentation] The 3rd International Teaching Games for Understanding Conference. Hong Kong Institute of Education, Hong Kong.

Morrisey, M. (2000). *Professional learning communities: An ongoing exploration*. Southwest Educational Development Laboratory. https://sedl.org/pubs/change45/plc-ongoing.pdf

Morse, J, M. (2007) "Sampling in grounded theory". In A. Bryant and K. Charmaz (Ed.), *The SAGE Handbook of Grounded Theory* (pp. 265-290). SAGE.

Morse, J., & Richards, L. (2002). Coding. In J. Morse & Richards (Ed.), *Read me first for a user's guide to qualitative methods* (pp. 111–128). Sage.

Mouza, C. (2009). Does research-based professional development make a difference? A longitudinal investigation of teacher learning in technology integration. *Teachers College Record*, 111(5), 1–24.

Nadeau, L., Godbout, P., & Richard, J. (2008b). The validity and reliability of a performance assessment procedure in ice hockey. *Physical Education and Sport Pedagogy, 13*(1), 65-83.

Nadeau, L., Godbout, P., & Richard, J. F. (2008a). Assessment of ice hockey performance in real-game conditions. *European Journal of Sport Science, 8*(6), 379-388.

Nadeau, L., Richard, J. F. and Godbout, P. (2008). 'The validity and reliability of a performance assessment procedure in ice hockey', *Physical Education and Sport Pedagogy, 13*(1), 65–83.

Nash, M. (2009). Using the idea of 'communities of practice' and TGfU to develop physical education pedagogy among primary generalist pre-service teachers. *Asian Journal of Exercise & Sports Science*, *6*(1), 15–21.

Nash, M. (2009). "Using the Idea of 'communities of practice' and TGfU to develop physical education pedagogy among primary generalist pre-service teachers." *Asian Journal of Exercise and Sports Science, 6*(1), 15–21.

Nelson, B. S., & Hammerman, J. M. (1996). "Reconceptualizing teaching: The teaching and research program of the Center for the Development of Teaching." In M. W. McLaughlin & I. Oberman (Ed.), *Teacher learning: New policies, new practices*. Teachers College Press.

Newmann, F. M., Marks, H. M., & Gamoran, A. (1996). Authentic pedagogy and student performance. *American Journal of Education,* 104(4), 280-312.

Newmann, F.M. (1994). *School-wide professional community. Issues in restructuring schools*. *Issue Report 6. Spring*, (pp. 1-2). Center on Organization and Restructuring of Schools: Wisconsin Center for Education Research, University of Wisconsin-Madison. http://www.wcer.wisc.edu/archive/cors/Issues%5Fi n%5FRestructuring%5FSchools/

Newmann, F.M. & Wehlage, G.G. (1995). *Successful school restructuring: A report to the public and educators by the center on organization and restructuring of schools*. CORS.

Newmann, F.M. & Wehlage, G.G. (1995). *Successful school restructuring: A report to the public and educators by the center on organization and restructuring of schools*. CORS.

Noffke, S., & Stevenson, R. (1995). *Educational action research: Becoming practically critical.* Teachers College Press.

Novick, R. (1996). Actual schools possible practices: new directions in professional development, *Education Policy Analysis Archives, 14*(4). http://epaa.asu.edu/epaa/ v4n14.html (accessed 16 April 1999).

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis. *International Journal of Qualitative Methods, 16*(1), https://doi.org/160940691773384

NSW, Board of Studies, (2003). *PDHPE syllabus.*

NSW, Department of Education and Training. (2003). *Quality teaching in NSW public schools: A classroom practice guide*. Professional Support and Curriculum Directorate, Sydney, NSW, Australia.

NSW, Department of Education and Training (DET). (2003). *Quality teaching in NSW public schools.* [Discussion paper]. Professional Support and Curriculum Directorate, Sydney, NSW, Australia.

NSW, Department of Education. (2008). *Quality teaching to support the NSW professional teaching standards.* State of NSW, Department of Education and Training, Professional Learning and Leadership Development Directorate 2008. http://currentreforms.weebly.com/uploads/2/6/9/9/26999857/quality_teaching_to_support_the_nsw_professional_teaching_standards.pdf

NSW, Department of Education. (2015). *Physical literacy continuum.* https://schoolsequella.det.nsw.edu.au/file/5ca9acad-3565-498f-8d00-8b448cee1015/1/PDHPE-continuum-01-08-2015-print-ready_nPJpvqCvCa.pdf

NSW, Education Standards Authority. (Nd). *Maintenance of Teacher Accreditation Policy.* https://educationstandards.nsw.edu.au/wps/portal/nesa/teacher-accreditation/meeting-requirements/maintaining-accreditation/proficient-teacher

NSW, Education Standards Authority. (2018). *Personal development, health and physical education: K-10 syllabus.* https://www.educationstandards.nsw.edu.au/wps/portal/nesa/k-10/learning-areas/pdhpe/pdhpe-k-10-2018

Opfer, V. D., & Pedder, D. (2011). Conceptualizing teacher professional learning. *Review of Educational Research*, *81*(3), 376–407. https://doi.org/10.3102/0034654311413609

Oslin, J., & Mitchell, S. (2006). "Game-centred approaches to teaching physical education." In D. Kirk, D. MacDonald, & M. O'Sullivan (Ed.), *The handbook of physical education* (pp. 627– 651). Sage.

Oslin, J., Mitchell, S., & Griffin, L. (1998). The Game Performance Assessment Instrument (GPAI) development and preliminary validation. *Journal of Teaching in Physical Education*, *17*, 231–243.

Oslin, J. (2005). The role of assessment in teaching games for understanding. In L. Griffin & J. Butler (Ed.), *Teaching Games for Understanding: Theory, research and practice.* Human Kinetics.

Oslin. J., Mitchell, S., & Griffin, L. (1998). The Game Performance Assessment instrument (GPAI): Development and preliminary validation. *Journal of Teaching in Physical Education, 17*(2), 231–243.

O'Donnell, C.L. (2008). Defining, conceptualizing, and measuring fidelity of implementation and its relationship to outcomes in K-12 curriculum intervention research. *Review of Educational Research, 78*, 33–84. https://doi.org/10.3102/0034654307313793

O'Leary, N. (2014). Learning informally to use teaching games for understanding. *European Physical Education Review, 20*(3), 367-384.

O'Sullivan, M. (2007). Creating and sustaining communities of practice among physical education professionals. *New Zealand Physical Educator*, *40*(1), 10.

O'Sullivan, M. O., & Deglau, D. (2006). Chapter 7: Principles of professional development. *Journal of Teaching in Physical Education, 25*(4), 441-449. http://eprints.teachingandlearning.ie/3289/

Parker, M., K. Patton, M. Madden, and C. Sinclair. (2010). "From Committee to Community: The Development and Maintenance of a Community of Practice." Journal of Teaching in Physical Education 29 (4): 337–357.

Parker, M., Patton, K., & Tannehill, D. (2012). Mapping the landscape of communities of practice as professional development in Irish physical education. *Irish Educational Studies*, *31*(3), 311–327. https://doi.org/10.1080/03323315.2012.710067

Parris, M. (2008). Email correspondence: a qualitative data collection tool for organisational researchers. In ANZAM 2008, *Managing in the pacific century* (pp. 1-13). Promaco Conventions.

Patton, M. Q. (1990). *Qualitative evaluation and research methods* (2nd ed.) Sage.

Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed). Sage Publications.

Patton, K, & Griffin, L. (2005). Exploring teacher change: Two teachers' experiences and patterns of change in a physical education teacher development project. *Research Quarterly for Exercise and Sport*, *76*(1).

Patton, K., Parker, M., & Pratt, E. (2013). Meaningful learning in professional development: Teaching without telling. *Journal of Teaching in Physical Education*, *32*(4), 441–459. https://doi.org/10.1123/jtpe.32.4.441

Patton, K., Parker, M., & Tannehill, D. (2015). Helping teachers help themselves: Professional development that makes a difference. *NASSP Bulletin*, *99*(1), 26–42. https://doi.org/10.1177/0192636515576040

Patton, K. & Griffin, L. (2008). Experiences and patterns of change in a physical education teacher development project. *Journal of Teaching in Physical Education, 27*, 272-291.

Patton, K. & Parker, M. (2014) Moving from 'things to do on Monday' to student learning: physical education professional development facilitators' views of success, *Physical Education and Sport Pedagogy, 19*(1), 60-75. https://doi.org/10.1080/17408989.2012.726980

Pearson, P., Towns, J., Webb, P., & Rowland, G. (2004). Game sense online - utilising the web for the professional development of physical and health education teachers. In Light, R., Swabey, K., & Brooker, R. (Ed.) *Proceedings of the 2nd international conference: Teaching sport and physical education for understanding* (pp 62-70). University of Melbourne, Australia.

Pearson, P., Webb, P., & McKeen, K. (2006). *Linking Teaching Games for Understanding (TGfU) and quality teaching (QT)*. [Paper presentation] Proceedings of 3rd International Conference: Teaching Games for Understanding. Hong Kong Institute of Education, Hong Kong.

Pearson, P., Webb, P., & Mckeen, K. (2006). *Linking teaching games for understanding and quality teaching in NSW secondary schools*, 37–46.

Pedder, D., Opfer, V. D., McCormick, R., & Storey, A. (2010). 'schools and continuing professional development in England - State of the nation' research study: Policy context, aims and design. *Curriculum Journal*, *21*(4), 365–394. https://doi.org/10.1080/09585176.2010.529637

Phillips, D. C. (1995). The good, the bad, the ugly: The many faces of constructivism. *Educational Researcher, 24*(7), 5–12.

Pill, S. (2008, January 21). Involving students in the assessment of game performance in physical education. [Paper presentation]. Flinders University 'Play to Educate' Sport in Education Conference, Adelaide, SA, Australia.

Pill, S. (2011). Seizing the moment: Can game sense further inform sport teaching in Australian physical education? *PHENex Journal*, *3*(1).

Pill, S. (2012, January). *Rethinking sports teaching in physical education*. [Dissertation for the degree of Doctor of Philosophy, University of Tasmania]. Faculty of Education, University of Tasmania.

Pollard, A. (2002). *Reflective teaching: effective and evidence-informed professional practice.* Continuum.

Prawat, R. S. (1992). Teachers' beliefs about teaching and learning: A constructivist perspective. *American Journal of Education*, *100*(3), 354–395. https://doi.org/10.1086/444021

Prawat, R. S. (1999). Dewey, Peirce, and the learning paradox. *American Educational Research Journal, 36*(1), 47-76.

Prenger, R., Poortman, C, L., & Handelzalts, A. (2017). Factors influencing teachers' professional development in networked professional learning communities. *Teaching and Teacher Education, 68*, 77-9

Priestley, M. 2010. *Curriculum for Excellence: Transformational Change or Business as Usual*. Scottish Educational Review. 42 (1): 23–36.

Priestley, M., & Biesta, Gert, author. (2015). *Teacher agency: An ecological approach.* London. Bloomsbury Academic.

QSRLS, (2001). *The Queensland School Reform Longitudinal Study.* State of Queensland, Department of Education.

Ragin, C.C. (1994) *Constructing social research.* Pine Forge Press.

Ramsey, G. (2000, November). *Quality matters, revitalising teaching: Critical times, critical choices*. [Report]. Review of Teacher Education, New South Wales.

Randall, L. (2003). Preservice teachers' understanding of the Teaching Games for Understanding approach to content delivery. *Avante, 9*(1): 49–61.

Randi, J., & Zeichner, K. M. (2004). New visions of teacher professional development. In M. A. Smylie & D. Miretzky (Ed.), *Developing the teacher workforce* (pp. 180-227). National Society for The Study Of Education.

Rangeon, S., Gilbert, W., & Bruner, M. (2012). Journal of coaching education. *Journal of Coaching Education*, *5*(1), 83–113.

Ravitch, S. M., & Riggan, M. (2017). *Reason & rigor: How conceptual frameworks guide research* (2nd ed.). SAGE.

Reinking, D., & Bradley, B. A. (2008). *Formative and design experiments: Approaches to language and literacy research*. Teachers College Press.

Rink, J. (2001). Investigating the assumptions of pedagogy. *Journal of Teaching in Physical Education, 20,* 112–128.

Roberts, S. J. (2011). Teaching Games for Understanding: The difficulties and challenges experienced by participation cricket coaches. *Physical Education & Sport Pedagogy*, *16*(1), 33–48. https://doi.org/10.1080/17408980903273824

Rodgers, C. (2002). Defining reflection: Another look at John Dewey and reflective thinking. *Teachers College Record*, *104*(4), 842–866. https://doi.org/10.1111/1467-9620.00181

Rolfe, L. (2001). The factors which influence primary student teachers' confidence to teach dance. *European Physical Education Review, 7*, 157-175.

Rossi, T., Fry, J., McNeill, M., & Tan, C. (2007). "The Games Concept Approach (GCA) as a mandated practice: Views of Singaporean teachers." *Sport, Education and Society, 12*(1), 93–111.

Roussin, J. L., & Zimmerman, D. P. (2014). Inspire learning, not dread. *The Journal of Staff Development, 35*(6), 36.

Rovegno, I. C. (1992). Learning to teach in a field-based methods course: The development of pedagogical content knowledge. *Teaching and Teacher Education, 8*, 69: 82.

Rovegno, I. C. (1994). Teaching within a curricular change zone of safety: School culture and the situated nature of student teachers' pedagogical content knowledge. *Research Quarterly for Exercise and Sport, 65*, 269-279.

Rovegno, I. (1998). The development of in-service teachers' knowledge of a constructivist approach to physical education: Teaching beyond activities. *Research Quarterly for Exercise and Sport, 69*(2), 147-162. https://doi.org/10.1080/02701367.1998.10607680

Rovegno, I. (1999, April). *What is taught and learned in physical activity programs: The role of content.* [Keynote presentation] AIESEP Conference, Besancon, France.

Rovegno, I. (2003). Teachers' knowledge construction. In, S.J. Silverman & C.D. Ennis (Ed.), *Student learning in physical education: Applying research to enhance instruction,* (2nd ed.) (pp. 295-310). Human Kinetics.

Rovegno, I., & Bandhauer, D. (1997). Norms of the school culture that facilitated teacher adoption and learning of a constructivist approach to physical education. *Journal of Teaching in Physical Education, 16*(4), 401–25.

Rovegno, I., & Dolly, J.P. (2006). Constructivist perspectives on learning. In D. Kirk, D. Macdonald, & M. O'Sullivan (Ed.), *Handbook of physical education* (pp. 242–261). Sage.

Rovegno, I., & Kirk, D. (1995). Articulations and silences in socially critical work on physical education: Toward a broader agenda. *Quest, 47*, 447-474.

Rovegno, I., Nevett, M., & Babiarz, M. (2001). Learning and teaching invasion game tactics in 4th grade: Introduction and theoretical perspective. *Journal of Teaching in Physical Education, 20*, 299–300.

Sagy, O., Hod, Y., & Kali, Y. (2019). Teaching and learning cultures in higher education: a mismatch in conceptions, *Higher Education Research & Development,* 38:4, 849-863, DOI: 10.1080/07294360.2019.1576594

Sagy, O., Kali, Y., Tsaushu, M., & Tal, T. (2016). The culture of learning continuum: Promoting internal values in higher education. *Studies in Higher Education*, 43(3), 416–436.

Sagor, R. (2000). *Guiding school improvement with action research.* Association for Supervision & Curriculum Development (ASCD).

Saunders, R. (2014). Effectiveness of Research-Based Teacher Professional Development:. Australian Journal of Teacher Education, 39(4). http://dx.doi.org/10.14221/ajte.2014v39n4.10

Scarino, A., & Liddicoat, A, J. (2009). Teaching and learning languages: a guide. *Learning Forward.*

Schön, D. (1983). *The reflective practitioner: How professionals think in action*. Basic Books.

Schön, D. (1987). *Educating the reflective practitioner*. Jossey Bass.

Schön, D. (1991). *The reflective practitioner: How professionals think and act*. Avebury.

Sellar, S., & Cormack, P. (2007). *Framing pedagogies: a review of frameworks and research designed to promote effective approaches to teaching and learning*. Centre for Studies in Literacy, Policy and Learning Cultures. Hawke Research Institute. University of South Australia.

Shulman, L. S. (1986). Those who understand teach: Knowledge growth in teaching. *Educational Researcher, 57*, 1-22.

Shulman, L. S. (1992) Toward a pedagogy of cases. In: J. H. Shulman (Ed.) *Case methods in teacher education* (pp. 1-30). Teachers' College Press.

Silverman, D. (2001); *Interpreting qualitative data.* Sage Publications.

Sjoer, E., & Meirink, J. (2016). Understanding the complexity of teacher interaction in a teacher professional learning community, *European Journal of Teacher Education, 39*(1), 110-125, https://doi.org/10.1080/02619768.2014.994058

Snyder, W., Wenger, E. & de Sousa Briggs, X. (2003). Communities of practice in government: Leveraging knowledge for performance. *The Public Manager*, *32*(4), 17-21.

Spalding, E., Klecka, C. L., Lin, E., Wang, J., & Odell, S. J. (2011). Learning to teach: It's complicated but it's not magic. *Journal of Teacher Education*, *62*(1), 3–7. https://doi.org/10.1177/0022487110384196

Sparkes, A. (1990). *Curriculum change and physical education: Towards a micropolitical understanding*. Deakin University.

Sparkes, G. M. (1992). Teachers' attitudes toward change and subsequent improvements in class- room teaching, *Journal of Educational Research, 80*, 111–117.

Sparks, D. (2002). *Designing powerful professional development for teachers and principals*. https://files.eric.ed.gov/fulltext/ED470239.pdf

Sparks, D. & Hirsh, S. (1997). *A new vision for staff development.* Association for Supervision and Curriculum Development and National Staff Development Council.

Sparks, D. & Loucks-Horsley, S. (1989). Five models of staff development. *Journal of Staff Development, 10*(4), 40-57.

Stake, R. (2003). Case studies. In N. K. Denzin & Y. S. Lincoln (Ed.), *Strategies of qualitative inquiry* (2nd Ed.) (pp. 134-164). Sage.

Stake R. E. (2000). Case studies. In: N. K. Denzin & Y. S. Lincoln (Ed.), *Handbook of qualitative research* (2nd ed). Sage.

Stenhouse, L. (1975). An introduction to curriculum research and development. Heinemann.

Stenhouse, L. (1985). Research as a basis for teaching. In J. Rudduck & D. Hopkins (Ed.), *Research as a basis for teaching*. Heinemann.

Stigler, J., & Hiebert, J. (1999). *The teaching gap.* Free Press.

Stoll, L., Bolam, R., McMahon, A., Wallace, M., & Thomas, S. (2006). Professional learning communities: A review of the literature. *Journal of Educational Change*, *7*. https://doi.org/10.1007/s10833-006-0001-8

Stoll, L., & Louis, K. S. (2007) *Professional learning communities: Divergence, depth, & dilemmas*. Open University Press.

Stolz, S., & Pill, S. (2012). Making sense of game sense. *Active & Healthy Magazine, 19*(1), 5-8.

Stolz, S., & Pill, S. (2013). Teaching games and sport for understanding: Exploring and reconsidering its relevance in physical education. *European Physical Education Review*, *20*(1), 1–36. https://doi.org/10.1177/1356336X13496001

Stolz, S., & Pill, S. (2014). Teaching games and sport for understanding: Exploring and reconsidering its relevance in physical education. *European Physical Education Review*, *20*(1), 36–71. https://doi.org/10.1177/1356336X13496001

Stran, M., Sinelnikov, O., & Woodruff, E. (2012). Pre-service teachers' experiences implementing a hybrid curriculum: Sport education and teaching games for understanding. *European Physical Education Review, 18*(3), 287–308. https://doi.org/10.1177/1356336X12450789

Stringer, E. (1996). *Action research: A handbook for practitioners*. Sage.

Sykes, G. (1996). Reform of and as professional development. *Phi Delta Kappan*, *78*(Mar), 465–467.

Thomas, G. (2009). *How to do your research project.* Sage.

Thorpe, R., Bunker, D., & Almond, L. (1986). *Rethinking games teaching*. Loughborough University of Technology.

Thorpe, R. & Holt, R. (2008). Inductive analysis. In, *The SAGE dictionary of qualitative management research.* Sage.

Timperley, H., Wilson, A., Barrar, H., & Fung, I. (2007). *Teacher professional learning and development: Best evidence synthesis iteration* (pp. 344) Ministry of Education.

Timperley, H. (2008). *Teacher professional learning and development.* International Academy of Education. International Bureau of Education. Educational Practices Series 18 http://www.ibe.unesco.org/fileadmin/user_upload/Publications/Educational_Practices/EdPractices_18.pdf

Tinning, R. (1987). Beyond the development of a utilitarian teaching perspective: an Australian case study of action research in teacher preparation. In: G. Barrette, R. Feingold, C. Rees & M. Pieron (Ed.), *Myths, models and methods in sport pedagogy*, (pp. 113–123). Human Kinetics.

Tinning, R. (1992). 'Action research as epistemology and practice: Towards transformative educational practice in physical education'. In A. Sparkes (Ed.), *Research in physical education and sport*, (pp. 188–209). Falmer Press.

Tinning, R. (1992) Reading action research: notes on knowledge and human interests, *Quest, 44*(1), 1–14.

Tinning, R., Macdonald, D., Tregenza, K., & Boustead, J. (1996). Action research and the professional development of teachers in the health and physical education field: The Australian NPDP experience, *Educational Action Research, 4*(3), 389-405.

Tinning, R., Macdonald, D., Wright, J., & Hickey, C. (2001). *Becoming a physical education teacher: Contemporary and enduring issues.* Pearson Education.

Tobin, G. A., & Begley, C. M. (2004). Methodological rigour within a qualitative framework. *Journal of Advanced Nursing, 48*(4), 388-396.

Tripp, D. (2004). Teachers' networks: A new approach to the professional development of teachers in Singapore. In C. Day & J. Sachs (Ed.), *International handbook on the continuing professional development of teachers* (pp. 191–216). Open University Press.

Tripp, D. (2004). 'Teachers' networks: A new approach to the professional development of teachers in Singapore. In C. Day & J. Sachs (Ed.), *International handbook on the continuing professional development of teachers*, (pp. 191–214). Open University Press.

Turner, A.P., Allison, P.C., & Pissanos, B.W. (2001). Constructing a concept of skillfulness in invasion games within a game for understanding context. *European Journal of Physical Education, 6*(1), 38–54.

Turner A. P. (2005). Teaching and learning games at the secondary level. In: L. L. Griffin, & J. L. Butler (Ed.), *Teaching Games for Understanding: Theory, research and practice*. Human Kinetics.

Vanblaere, B., & Devos, G. (2016). Relating school leadership to perceived professional learning community characteristics: A multilevel analysis. *Teaching and Teacher Education*, *57*, 26–38. https://doi.org/10.1016/j.tate.2016.03.003

van Zee, E. H., & Minstrell, J. (1997). Using questioning to guide student thinking. *Journal of the Learning Sciences, 6*, 227–269.

Villegas-Reimers, E. (2003). *Teacher professional development: An international review of literature.* UNESCO: International Institute for Educational Planning.

Vygotsky, L. (1986). *Thought and language.* MIT Press.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes.* Harvard University Press. Published originally in Russian in 1930.

Wang, C. L., & Ha, A. S. (2009). "Pre-service teachers' perception of Teaching Games for Understanding: A Hong Kong perspective." *European Physical Education Review, 15*(3), 407–429.

Wang, C. L., & Ha, A. S. (2012a). "The theory of planned behaviour: Predicting pre-service teachers' behaviours towards a constructivist approach." *Sport Education and Society, 18*(1), 47–61.

Wang, C. L., & Ha, A. S. (2012b). "Factors influencing pre-service teachers' perception of Teaching Games for Understanding: A constructivist perspective." *Sport, Education and Society, 17*(2), 261–280.

Wang, C. L., & Ha, A. S. (2012c). "Mentoring in TGfU teaching: Mutual engagement of pre-service teachers, cooperating teachers and university supervisors." *European Physical Education Review, 18*(1), 47–61.

Wang, L., & Ha, A. S. (2013). Three groups of teachers' views, learning experiences, and understandings of teaching games for understanding, *Physical Education and Sport Pedagogy, 18*(3), 336-350. https://doi.org/10.1080/17408989.2012.666789

Watts, G. D. & Castle, S. (1993). The time dilemma in school restructuring. *Phi Delta Kappan, 75*(4), 306-310.

Webb, P. & Pearson, P. (2008). An integrated approach to teaching games for understanding (TGfU). [Paper presentation]. 1st Asia Pacific Sport in Education Conference, Adelaide, SA, Australia. http://ro.uow.edu.au/edupapers/52

Webb, R., Vulliamy, G., Sarja, A., Hämäläinen, S., & Poikonen, P-L. (2009). Professional learning communities and teacher well-being? A comparative analysis of primary schools in England and Finland. *Oxford Review of Education, 35*(3), 405-422.

Wenger, E. (1998). *Communities of practice: Learning, meaning and identity*. Cambridge University Press.

Wenger, E. (2000) Communities of practice: The organizational frontier. *Harvard Business Review, January–February*, 139-145.

Wenger, E., McDermott, R., & Snyder, W. M. (2002). *Cultivating communities of practice*. Harvard Business School Press.

Werner, P., Thorpe, R., & Bunker, D. (1996). Teaching games for understanding: Evolution of a model. *Journal of Physical Education, Recreation & Dance, 67*(1), 28-33.

Wenglinsky, H. (2000). *How Teaching Matters: Bringing the Classroom Back into the Discussions about Teacher Quality.* Educational Testing Service. Princeton, NJ. http://www.ets.org/research/pic/teamat.pdf

WestEd. (2000) *Teachers who learn—kids who achieve: A look at schools with model professional development.* WestEd.

Whitehead, J. (1989). Creating a living educational theory from questions of the kind, 'How do I improve my practice?' *Cambridge Journal of Education*, *19*(1), 41–52. https://doi.org/10.1080/0305764890190106

Wilson, S., & Powell, S. (2013). Teacher professional learning: Learning to WALK and the NSW Quality Teaching Framework. *The Australian Journal of Teacher Education, 38*(2), 37-49.

Wisniewski, B., Zierer, K., & Hattie, J. (2020). The power of feedback revisited: A meta-analysis of educational feedback research. *Frontiers in Psychology*, *10*.

Witterholt, M, Goedhart, M., Suhre, C., & Van Streun, A. (2012). The Interconnected Model of Professional Growth as a means to assess the development of a mathematics teacher. *Teaching and Teacher Education, 28*(5), 661-674.

Wood, D., Bruner, J., & Ross, G. (1976). The role of tutoring in problem-solving. *Journal of Child Psychology and Psychiatry and Allied Disciplines, 17*, 89-100.

Wright, S., McNeill, M., & Fry, J. M. (2009). The tactical approach to teaching games from teaching, learning and mentoring perspectives. *Sport, Education and Society*, *14*(2), 223–244. https://doi.org/10.1080/13573320902809153

Wright, S., McNeill, M., Fry, J., Tan, S., Tan, C., & Schempp, P. (2006). Implications of student teachers' implementation of a curriculum innovation. *Journal of Teaching in Physical Education, 25*, 310-328.

Yin, R. (2018). *Case study research and applications: Design and methods* (6th ed.).

Yin, R. K. (1981). The case study as a serious research strategy. *Science Communication, 3*(1), 97-114.

Yoon, K., & Armour, K, M. (2017) Mapping physical education teachers' professional learning and impacts on pupil learning in a community of practice in South Korea. *Physical Education and Sport Pedagogy*. 22:4, 427-444, DOI: 10.1080/17408989.2016.1268589

Yoon, K. S., Duncan, T., Lee, S. W. Y., Scarloss, B., & Shapley, K. L. (2007). *Reviewing the evidence on how teacher professional development affects student achievement.* (Issues & answers Report No. REL 2007–No. 033). U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Southwest. http://ies.ed.gov/ncee/edlabs

Zeichner, K. M. (1994) Research on teacher thinking and different views of reflective practice in teaching and teacher education. In I. Carlgren, G. Handal & S. Vaage (Ed.), *Teachers' minds and actions: research on teachers' thinking and practice* (pp. 9-27) Falmer Press.

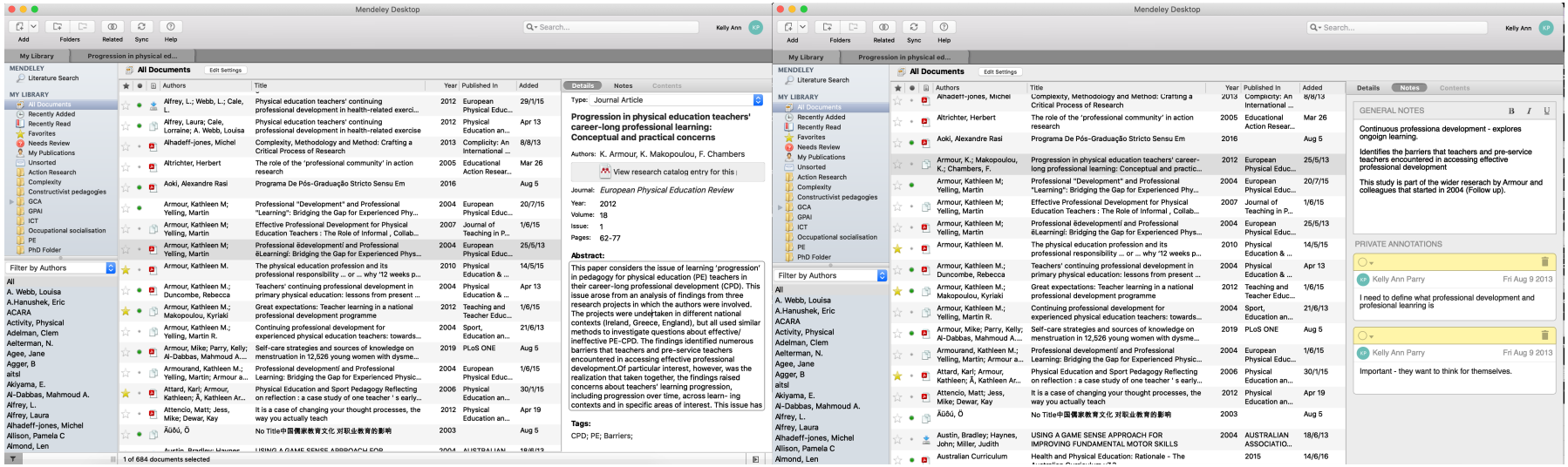
Zimmerman, J. (2006). Why some teachers resist change and what principals can do about it. *NASSP Bulletin, 90*(3), 238–249.

Zuccolo, A., Spittle, M., & Pill, S. (2014). *Game sense research in coaching: Findings and reflections.* University of Sydney Papers in HMHCE – Special Games Sense Edition 2014

Appendices

Appendix 1

1. Mendeley Library Database



Appendix 2

2. Literature Map

Appendix 3

3. Researcher Biography

There were many influences that led to the decision to pursue this research. The first stems from my experience in Physical Education as a child and later in Physical Education Teacher Education. Undertaking my teaching degree at Brunel University, West London, where TGfU was central to their teaching philosophy, had a significant influence on me adopting game centred pedagogy as part of my own teaching philosophy and practice. My experiences and frustrations as a Head Teacher trying to shift the pedagogy of my faculty from a focus on skill driven practice to a pedagogy that aligned with my own philosophy in games-centred approaches, also played a significant role in me conducting a research study in this area.

The games based and student-centred education I experienced at University offered a welcomed shift from my heavily technical and didactic experience of Physical Education in High school. Although, I had always enjoyed PE at school, regardless of the focus on skills and large sided games. I was an eager participant in PE lessons and a passionate member of the school Hockey and Netball team. I was actively engaged in organised sport, representing both my county and country in Hockey. This passion for Hockey led me to pursue Physical Education at a tertiary college and then into University as a Physical Education Teacher.

My earliest memories of sport come from playing netball at Primary school; my height advantage in comparison to the other girls my age, made me a natural selection for the school Netball team and set me on the path to participation in organised sport. Playing in the Netball team was a prerequisite for being enlisted in the Rounders team during the summer season, regardless of whether you had played before or your skill set. Having a highly competitive and gifted soccer player as a Dad and a naturally athletic brother ensured I maintained an interest in sport both as an active participant and a spectator on the side-line most weekends.

The comprehensive school I attended prided itself on its sporting prowess and was renowned for its sporting culture, among the local High schools. Physical Education classes were single sex and mostly focused on skill drills and full-sided games. Girls participated in what were

deemed ‘girl specific’ sports such as Hockey, Netball and Rounders, whilst the Boys participated in Football, Rugby and Basketball. Swimming and gymnastics lessons were heavily technical and very teacher directed. I recall the embarrassment I felt having to swim lengths in the pool whilst the rest of the class stood and watched me struggle. I remember playing Hockey out in the rain on the rough gravel surface, regardless of the wet and cold weather. Essentially, our PE teacher (and Hockey coach) used our PE lessons as a training session for our school Hockey team, of which I was fortunate to be a member of. We would spend half of the lesson on skills, dribbling round cones, followed by a shot at goal and then the other half on a game, which would involve half the class against the other. One side would include all the attacking players from the school team whilst the other side would have all the teams’ defensive players. Students that didn’t play on the school team were expected to take turns in goals and fill in the gaps; they were rarely passed the ball and clearly didn’t enjoy the lessons. For me, I enjoyed PE lessons, especially when we were doing games units and had incredible respect for my PE teachers. Playing for the School Hockey team, we were expected to attend practice two lunch times a week and once after school. Our teacher was passionate and clearly skilled, she demonstrated what was required in the skill drills and provided technical instruction as we each went through the drill. Similar to our PE lessons, the second half of Hockey practice included a game in which our teacher refereed.

My experiences playing Hockey outside school was quite different, I had a fantastic coach, who represented Wales playing the same position as I did. Her training sessions were focused on defensive play and used set plays and small games to develop skill. We played full sized games but received positional specific feedback. Feedback extended beyond technical performance to positioning and off the ball movement. It was a combination of my enjoyment participating in Physical Education at school and my love and positive experiences playing Hockey that saw me pursue a career in PE teaching. My Hockey coach taught in a nearby college, which helped my decision to finish school at attend a different college to most of my friends. Playing at a college level was even more involved than a school level; we were required to attend fitness sessions early before class, as well as practice and games.

In my quest to become a Physical Education teacher I attended Brunel University in West London to further my education. Again, I continued to play Hockey, encountering various styles of coaching. I found myself becoming quite reflective of the way I was being coached

and the styles I preferred. However, it was my experience through my practical PE Subjects and my experience out on teaching practice that helped shape my teaching philosophy that was heavily grounded in game centred and students centred practice, the most. My Physical Education modules were coeducational, practical sessions included a wide variety of activities, for the first time I got to participate in sports such as Rugby, Soccer and Basketball. We got to experience Athletics activities such as High Jump and Hammer, along with synchronised Swimming and Lifesaving. Activities were delivered through a mix of Teacher centred and student-centred teaching. In theory lessons we were taught about TGfU and learnt about small-sided modified games. In our game's lessons, we were shown how games could be modified so that we could all participate, regardless of our experience and skill level. However, when I went on teaching practice, I observed very similar teaching practice to what I had received at school. There was still a focus on skill drills and games. There was one very clear difference to my experience at school and that was the notion of modification and differentiation. We were faced with classes that were mixed gender and mixed ability and really had to try and design activities that could be pitched at different levels, so that all students could participate in the lesson.

It was in my third year of University, where we spent most of the year in school on teaching practice that I really got to see some great Games teaching in action. One of the teachers at my placement school had attended a University where TGfU and its guiding principles also played a significant role in shaping his teaching philosophy. He provided me with practical examples of how these principles looked in practice and encouraged me to design similar lessons. He provided me with feedback on class management and my selected activities, encouraging me to reflect on what worked and what didn't and why. The students in my classes had a diverse range of abilities and he supported me to design activities that supported their needs. Collaboratively, we designed a dance unit that was student-centred and explored movement rather than just learning set moves. We also designed a unit of work on student-designed games, which provided a springboard for future units of student-centred work.

Fortunately, my first teaching job as a newly qualified teacher was with a school in West London with and excellent young Head Teacher PE, whose teaching practice exemplified game-centred practice. We team taught a lot of our lessons where I had the opportunity to observe excellent game-based pedagogy. Our faculty was small which encouraged the sharing

of lesson plans and resources; this allowed me to develop a repertoire of modified skills and was supported in developing my own practice. Most valuable was the relationship I developed with my students, particularly since I spent lots of time with some of them through the various extracurricular clubs, I took including Netball, Rounders and Dance. It was this relationship with my students that allowed me to learn about them as learners, how they learnt best and how individual their learning experience was, which really helped shape my teaching practice.

Leaving this school, I moved to Australia and managed to land a PE teaching job in a Northern Beaches High School in Sydney. Again, I was part of a small faculty that were open to sharing practice and supporting each other through team teaching. Teaching was very skill based and technically focused, most lessons focused on developing a skill then playing a small sized version of the full-sized game. I found that my teaching mirrored what I was seeing done around me. I felt that I had to fit to what the other teachers were doing, because that is what was done. After a few years at the school we were finally appointed a PE Head Teacher who filled the dual role of Head Teacher Teaching and Learning role. Driven by the NSW Quality Teaching framework, she pushed to raise the Quality of teaching and learning programs in the school. As a faculty, we had to develop examples of quality units of work both in Health 'theory' lessons and our PE 'practical' lessons. She challenged us to look at what we were doing in our lessons and reflect on our own teaching and learning. This was a turning point for me, I was able to see how teacher centred and skill focused my teaching had become and how this failed to align with what we were exploring in relation to quality teaching. I started to revisit what I had learnt at University and began to shift my practice back to what I had been doing in my early years of teaching. My HT encouraged me to research TGfU and deliver PD to our faculty. The more I researched and delivered my lessons using game-based pedagogy, the more I could draw parallels to the quality teaching framework and the more I saw the benefits for my students. I started taking on more student teachers for their teaching practicum and worked with them to develop and deliver game-based lessons. As my confidence grew again, I started working with a University and regularly had a cohort of PETE students come and observe my TGfU based lessons.

Later I was appointed HT PDHPE, where I made it my faculty goal to embed game-based practice into our curriculum programs. I spent my time team teaching and providing professional development to support my faculty in shifting their pedagogy to resemble a

game-centred and student-centred philosophy. I designed several games-based units and worked with my faculty to develop some of their own. We purchased a range of resources, providing us with examples of game-based pedagogy in practice and took time building these examples into our programs. However, when observing their lessons, I saw the struggles they faced delivering these game-based lessons. Often lessons would end up being just small sized versions of the real game with the teacher refereeing. I tried to work with my faculty to understand the difficulties they were experiencing and to find out how I could support them, but I was met with some resistance.

In 2012, I applied for the NSW Premiers Teaching Scholarship, to undertake a five-week study tour to research TGfU, in order to better understand how it can be embedded in others and my professional practice. I was fortunate enough to be awarded with the scholarship to study TGfU and its origins, pioneers and examples of excellent practice. They study tour took me to Bathurst, Wollongong, Canada and finally to Loughborough, where the TGfU model was first pioneered with Bunker and Thorpe in 1982, which fortunately coincided with 5th International TGfU conference. It was my experience and encounters on this study tour that led me to pursuing a career in Higher Education and seeking to complete my PhD. My personal experience of trying to shift pedagogy within my own faculty and hearing similar struggles on my study tour led me to refining my PhD research around PD within TGfU.

Appendix 4

4. Post Teaching Reflection Analysis (PTRA) Scaffold

Date:		**Time:**		**Class:**	

Activity:		**Venue:**	

1. What were your goals for the lesson?
For you as a teacher:
For your pupils:
2. What did you see in your lesson that you met your goals? Be specific.
For you as a teacher:
For your pupils:
3. What were the most positive aspects of the class?
For you as a teacher:
For your pupils:

4. What aspects did you feel did not go well?
5. What changes would you make to the lesson the next time you teach it?
6. Learning Outcomes: Did you see learning occur? Specifically what?
7. What are your specific goals for the next lesson? What strategies will help you achieve your goals?
Teacher goals:
Pupil Goals:

Appendix 5

5. School Biography

School Biography

Sample High school is a culturally diverse, co-educational, specialist high school with a creative art focus within the government sector. The school population at the time of study included 490 students from years 7-12, with a teaching staff of 45. The divide of boys and girls is 56% and 44% respectively with 1% Indigenous students and 21% of students with a language background other than English. This is a smaller school when compared to others within the surrounding areas. Consequently, the school prides itself on the belief that it is able to offer a very personalised and individual approach to supporting student learning and achievement.

Culture and Climate

The school is set in an affluent suburb on the edge of a beautiful National Park. The school affords excellent sporting facilities including three grass sports fields, two outside Tennis courts, two outside Netball/Basketball courts, an indoor space and an additional covered space, a school hall and a synthetic turf hockey pitch.

Sample High School prides itself on having a strong relationship between the academic, physical, mental and socio-cultural needs of students, believing that they are of equal importance and crucial to ensuring successful educational outcomes. The school offers a well-balanced curriculum with a wide range of academic, creative, sporting, performing and co-curricular experiences including leadership opportunities.

The school has a wide drawing area with the opportunity for students from outside that area to apply for enrolment. Sample High School has a long-standing culture of Creative & Performing Arts. The educational focus of the school is on creativity, innovation and challenge. They offer the same curriculum as all secondary schools in NSW. However, it is enhanced by a special structure, which allows for a creativity stream. This Talent Enrichment Program (TEP) offers students who are gifted, talented or interested in creative or performing arts, sports, technology or design options, the opportunity to choose extra classes, often with

tutors or coaches to engage them and further develop their skills and interests. The school also offers a scholarship program specialized Year 7 Creative and Performing Arts class for Music, Dance, Visual and Digital Arts and Drama.

PDHPE Faculty Biography

The PDHPE faculty includes four full time PDHPE teachers, Two Male: Barry and Fred and two Female: Jenna and Sarah. All except Sarah are permanent staff members and have been at the school for an extended period of time. The teachers' ages range from 25 to 55 years and teaching experience varies from 2 to 16 years. The faculty runs separate theory (PDH) and practical lessons (PE) in years 7 to 10 and offers elective subjects within stage four and five, including the Physical Activity and Sports Studies (PASS) course in Stage 5 and PDHPE, Sport Leisure and Recreation (SLR) and Community and Family Studies (CAFS) in stage 6, along with a Talent Enrichment Program (TEP) for Sport. Additionally, each of the PDHPE teachers takes on a wider school role including Year Advisor and Assistant Year Advisor, Sports Organiser and additional responsibilities including running physical activity schemes like 'Jump Rope for Heart' and School Camps.

Culture and Climate

There is no PDHPE Head Teacher within the faculty and during the time of this study were assigned to the Science Head Teacher and then to the Deputy. They appeared disconnected from their assigned faculty Head and had a troubled relationship with the executive team. The Principal expressed her concern regarding the faculties disconnect and had sought the faculties involvement in this study as a 'cry for help', in the hope to establish a more supportive relationship with the PDHPE Faculty and attempt to support their PD and align their teaching practice with how she believed they should be teaching.

Current Teaching Practice in PE

The faculty run a very 'traditional' PE program where the scope and sequence of activities offered in Term one and two is designed around the Athletics and Cross-Country carnival; using PE lessons as practice sessions, despite having very low participation rates within their school carnivals. The teachers mostly run 5-8-week units in specific/singular sports including Dance, Cross Country and Athletics etc. For the majority of the year, the PE program is heavily dominated with invasion games e.g. Soccer, Netball, Basketball, Touch Rugby etc.

The sports taught mirror the favoured sports of the PDHPE teachers. On my arrival to start my first cycle of research (Term two), they had just completed a 5-week Cross Country unit of work and were running a 6-8-week Athletics unit up until the Athletics carnival. Class sizes were mostly small with only 20-24 students in each class.

Team Teaching

The majority of PE lessons were timetabled on at the same time, so the teachers mostly joined the two or three classes together and team-taught the lessons. Most lessons were structured so that the classes could be team-taught, as explained by Barry, "It's usually all team teaching" (Barry, Teacher Interview, 20 March 2014). Team teaching mostly entailed one teacher taking the lead delivering the lesson and the others playing a more supervisory role. Lesson content mostly included large, full size versions of games where students were organised into large teams and played a round robin tournament against each team. Alternatively, lessons were skill based where students practiced isolated skills in pairs or groups then played a full-sized version of the game with very little facilitation from the teacher. Barry illustrates this by providing insight into the skill-based lesson that he and Fred would be team teaching next:

> Fred and I are pretty much going to do Touch Football. We will have lines and run through the back line, make sure they can, catch and pass, catching and passing, you know and then we will go into games. And then in the games, we probably won't interact with the kids too much. We will just referee or watch.
>
> (Barry, Teacher Interview, 20 March, 14)

Lessons were an hour long and were structured in exactly the same way for each class and lesson. Students were required to get changed at the beginning and end of the lesson, which could take up to 15 mins of the lesson. Students were expected to line up in the canteen sitting in class groups in front of the teachers that were taking the lesson and the roll was marked. The whole process took up nearly 10 mins, leaving only 35 mins for activity. There was regularly a large group of students that failed to bring their uniform or were unable to participate in physical activity. These students were permitted to sit out and away from the lesson. In my observations, these students were rarely engaged in the lesson and were allowed to sit and chat.

Expectations for Student Learning in PE

The PDHPE teachers believed that the students demonstrated a basic level of psychomotor skill. Fred compared the students to other schools within the area and stated, "we have a lot of kids that do not have those basic skills anyway" and "we are a creative Arts high school, we haven't got the worlds sportiest kids" (Fred, Teacher Interview, 20th March 14). There appeared to be a faculty concern for the perceived low level of physical ability which the teachers believed had implications for how and what they taught in their PE lessons, justifying their focus on a skill-based approach.

Technical focus for Learning in PE

The PDHPE teachers focused mostly on learning within the physical domain and designed lessons and occasional assessment around movement skills. They perceived student learning in terms of physical performance and improvement in movement skill. They attributed their preference for a skill-based teaching approach to the perceived poor ability of their students, believing this to be the best way to improve skill:

Barry:	We have kids in year 7 that can't catch and can't throw
Fred:	Yeah so, we have to go back to basics, stage 2 and 3 type skills
Researcher:	So, you feel that a skills-based approach is what will help develop those skills
Fred:	Yeah, I suppose. I find if you are using a different type of game like touch football into gridiron, some of the kids we have here won't even have the basic skills like touch football skills. (Teacher interview, 20 March 2014)

The teachers believed that a skill-based approach was the best way to teach their students and assist in achieving the desired student outcome of improving movement skills: "we have to prioritise and look at our clientele and think well, it would be nice if they could catch before they leave year 10" (Barry, 28 March 2014). It was clear to see that the focus in PE was to get students active. Barry explains, "I think sometimes doing invasion games, you get all your kids involved; I think it is a necessary means sometimes, because you have to get 80 kids activated. If I have 10 teams and they are all playing a game like that, it is much easier to control" (Barry, 28 March 2014).

Lack of Structured Learning

Learning often appeared unstructured and unrelated to the syllabus outcomes, neither the 'skill' outcomes nor 'Knowledge and Understanding' outcomes. It was clear to see that they did not intentionally focus learning on the 'skill' outcomes within the syllabus and when questioned, the teachers were not really clear on what 'Knowledge and Understanding' outcomes they were addressing from the syllabus either:

> Researcher: What about those other skills in our syllabus, communicating, problem solving?
>
> Fred: Probably not thinking that we are focusing on it but we do bring it into the lessons, I know like I will say like, if we do like invasion games, like are you talking to your teammates, things like that, so you are bringing it in, when you say "is this working for you" "are you able to score a goal" that is like problem solving for them without thinking that we are teaching problem solving now in the game.
>
> (Teacher interview, 20 March 2014)

There were no formal PE units of work for any of the practical units; lessons appeared to be run on an a very 'ad hoc', spur of the moment basis where they chatted amongst themselves just before the lesson was about to start, to work out what they would do with the class and who would be running the lesson. It was clear to see that there was no structured planning around the PE units or lessons.

Limited prior experience of GCAs

The PDHPE staff had previous been engaged with limited PD opportunities. They particularly expressed their lack of any Physical Education PD and the failure of any previous PDHPE PD to actually support a change to their teaching practice. They acknowledged that they reverted back to the way he had always taught when trying something new proved too difficult or was challenged by the students:

Barry: When it gets difficult, you just revert to what you know, as soon as you have the kids go ‘ah no we are not doing that.

Fred: You go back to your comfort zone.

Fred: It is all good in theory, up on the white board and on the ‘smart Board’, and you go, “oh yeah that is really, really great” but then to come back and change all your programs, that you have spent years writing, you do revert back to what you know. I have always said that you come out of professional development and you go, well how is that going to change my teaching, and well, it hasn’t.

(Teacher interview, 20 March 2014)

Appendix 6

6. Teacher Biographies

Barry

Teaching Experience

Barry is the most senior PDHPE faculty member, having taught at Sample High School for over 19 years. Barry is a permanent member of staff. In the absence of a Head Teacher, he is clearly a leader within the faculty and carries influence, where the other teachers appear to run things by him. He is approaching the end of his career, appearing very set in his ways. Barry has witnessed many teachers come and go from the faculty, including several Head Teachers, along with both Jenna and Fred joining the faculty as newly qualified teachers. The teachers note,

> Researcher: How long have you been here [Barry]
> Barry: 19 years, so I am entitled to be grumpy
> Researcher: Yeah, it just comes with age anyway [jovial manner]. I'm going to call you 'Victor Meldrew'.
> Barry: That's what these two were doing, Fred and Jenna, they were sitting around the other day talking about the place and realized that they are…
> Jenna: We are the age that you were when we first started as youngies and newbies.
>
> (Teacher interview, 28 March 2014)

Barry takes on the additional school roles of Year 12 Assistant Advisor and School Sports Coordinator, which he protests takes up most of his time, making it very difficult for him to be part of the study. He teaches Year 12 PDHPE and mostly takes the Year 10 classes, including a Talented Education Program (TEP) Sport load.

Personal Setting

Barry lives local to the school, is married and has a Primary school aged child, whom he drops off and pick up before and after school. As such, he arrives just before the school bell and needs to leave quickly after school

Current Teaching Practice

Barry describes himself as an 'old school' teacher whose teaching philosophy is strongly embedded in keeping the students' active and playing a big game:

> I think sometimes doing invasion games, you get all your kids involved; I think it is a necessary means sometimes, because you have to get 80 kids activated. If I have 10 teams and they are all playing a game like that, it is much easier to control. (Barry, Teacher interview, 28 March 2014)

Barry appeared content to combine classes and 'team-teach' where he often willed the other teachers to take the lead, which allowed him the opportunity to use the time to dismiss himself and get 'TEP' sport organised. During Phase A, he had several days off to plan, organise and recover from the Sports carnivals.

Knowledge and Understanding of GCAs

Barry has very little knowledge and understanding of GCAs and very little experience in teaching using games-based pedagogy. He claims to be 'old school' which he attributes to his teacher training and his focus on a technical approach.

Participation in the study

During Phase A (Needs Assessment) Barry was very active in our group interviews. He provided good insight into his current teaching practice and openly discussed his limited knowledge of GCAs and what his needs would be if he were to take part in the study. However, despite initially committing to the research, Barry expressed his intention to withdraw from the study in the very first group discussion. He explained that it would be too difficult to commit to the study when he wasn't teaching the same year group as the others. Despite me reassuring him that he could still be part of the study, offering to do everything she could to support him, he made it very clear that he did not wish to be part of the study,

finally blaming his Sports Coordinators role and lack of time as the deciding factor. In one of my journal entries, I noted:

> Barry has made it very clear that he doesn't want to be involved in the project, despite me telling him I can overcome all the barriers he has suggested existed. It is clear that he doesn't want to do the work and doesn't really want me observing his lessons.
>
> (Researcher reflective Journal, 28th March 2014)

Barry still contributed to the group interviews, often volunteering his own insight and thoughts, despite withdrawing from the study and not engaging with the GCA lessons.

Fred

Teaching Experience

Fred is an experienced PDHPE teacher, having taught at Sample for over 9 years and 4 years at other schools.

Fred is a permanent member of staff at Sample, teaching Junior PDHPE, Year 11 PDHPE and Year 11 CAFS, along with a Sport load. He also takes several Junior Maths lessons and the additional role of Year 11 Advisor. During cycle one of the research the PDHPE teachers experienced a timetable change as a result of a collapsed class in Year 7. This resulted in Fred disappointedly being timetabled on more maths classes, losing most of his Junior PDHPE, his Year 11 CAFS class and his sport load. Fred appeared very frustrated and disappointed by this change, particularly over losing so many PE (practical) lessons. Fred clearly enjoyed taking the PE lessons, especially outside. He disappointment is noted in the following conversation.

Fred:	Yeah, it's just so many periods outside of PE. I had kind of worked it out, but it is still…
Researcher:	It's just a bit of a shock! Are you ok?
Fred:	Ah yeah! 4 periods of 8K, so I lose one year 8 class. I've only got 1 period of 8K!
Fred:	1, 2, 3, 4… I am outside in the lovely blue sky 4 times
Fred:	I am outside, in a fortnight, 3 times
Sarah:	Because you have only got year 9?
Fred:	Yeah, 10 PE. One class outside! I've got 10 PE for 3 lessons, because that is still that period that I take for you [Sarah], my year 9 class because 8K is theory.
Sarah:	No, you take a prac' [PE]. I'll take a theory.
Fred:	4 out of my 38 is now prac' [PE], 34 inside.
Fred:	I've got 4 periods outside!

Personal Setting

Fred is a family-oriented person with 3 children, living a fair distance away from the school, involving a substantial commute each day. This meant that Fred arrived at school and had to leave school on the bell, as soon as lessons started and finished, in order to skip the rush hour

traffic. In his spare time, Fred is a keen athlete, taking part in numerous Ironman and Triathlon competitions, which involved extensive commitment and training. During cycle one of the research he took a couple of days off school to compete and recuperate from a competition.

Current Teaching Practice

Fred appeared to have an excellent rapport with the students and always engaged with them in a friendly, albeit professional manner. The students were very compliant to his instructions and joked with him in a relaxed manner. The lessons I observed of Fred (Soccer and Javelin) embodied that of a skill based, technical approach. His Soccer lesson involved two large games with a random mix of students on two large playing fields and a very structured Javelin lesson, where students were organised into 5 lines and took it in turns to throw and retrieve the javelin for the entire lesson. In the two lessons he observed of mine, he was actively engaged, interacting with the students and making his way around each of the groups. However, he appeared to have limited knowledge of the syllabus when discussing the outcomes, he thought I might be addressing in the lesson

Knowledge and Understanding of GCAs

Fred appeared to have limited knowledge of GCAs and of the study premise. He missed the information session run before the teachers agreed to participate in the study. Although, in the beginning of the study he always appeared enthusiastic and willing to be involved, initially remaining positive about the PD opportunity. Fred was open about his limited GCA experience:

Researcher:	So, Fred last week you were talking about your understanding of GCAs or Game Centred Approaches as modified games and questioning, what do you think these modified games look like?
Fred:	I don't know. I have got zero idea. [Laughter from other teachers]
Researcher:	That's ok
Fred:	I'll tell you, I have got zero idea of what it will look like, to be brutally honest, I don't think I could tell you what it looks like.

(Researcher Reflective Journal, 28th March 2014)

Participation in the study

Fred was committed at the start of the study, willingly engaging in our group interviews and keenly offering his thoughts, opinions and feelings. He appeared enthused to be part of the study, albeit recognising it was going to be a 'challenge'. Fred was instrumental in setting up the parameters of the study, identifying the 'best' classes to work with and the most fitting lessons to be observed and the best time for me to come in and teach some lessons for them to observe. Unfortunately, during the Planning Phase (Phase B), Fred wasn't able to commit any time to planning the unit or subsequent lessons or engage in any of our group discussions. His time appeared to be impacted by his new timetable with the greater Math load. Sarah noted, "Fred didn't even get a chance to really look at it [Unit Plan] because he had so much he needed to do in terms of he just got a new timetable and he's in another faculty for half his lessons" (Teacher interview, 1st May 2014). Regardless, Fred expressed that he was still keen to take part in the study. We came to an arrangement that he would use Sam's lessons and teach Soccer rather than his originally chosen Touch Football unit. Disappointingly, this never eventuated; during the third week of the Implementation Phase (Phase C) Fred hadn't conducted any of the planned GCA lessons. Finally, he sent an email withdrawing from the study:

> I have spent the last few hours reflecting on your request you asked of me this afternoon after school.
> It is for these reasons that I wish to opt out of the GCA study. My current workload and commitments to my other roles within the school will not allow me to allocate the time you require for your study and outcomes. I know I am a committed teacher to my students, who respect my knowledge and dependability to them and their education. To only apply a small amount of time I have available to your study and research is not fair to you, Sarah, Jenna and most importantly my students. (Fred, email correspondence, 30th May 2014)

Sadly, Fred spent the rest of the term and Cycle 2 of my research avoiding any contact with me, going to great lengths to stay out of my way.

Jenna

Teaching Experience

Jenna has worked at Sample High School for 13 years, alongside Barry. It was her first placement school as a newly qualified teacher, and she has been at the school since. Jenna has only ever taught at Sample High School. Jenna is also the Year 12 Advisor and has a close bond with this year group, her commitment to this year group is evident particularly as they near the end of their schooling. Jenna teaches most year groups, including Year 11 and 12 CAFS and SLR. She is an experienced and confident teacher, displaying excellent class management and a good rapport with her students. She is clearly a leader within the faculty and appears to have a good influence and relationship with the other PDHPE staff.

Personal Setting

Jenna is single Mum of three and is actively involved in sport outside of school, playing and coaching in a local Netball team, along with supporting her three children in their sporting endeavours in Football, Dance and Gymnastics. Jenna lives close to the school, but her family commitments mean that she arrives at school on the bell, as class starts, and she has to leave straight after the last period in order to collect her children from school.

Current Teaching Practice

Jenna's lessons run smoothly, she provided very clear instruction and engaged the students throughout the lesson. Jenna often took the lead in team teaching and was able to organise the groups quickly and efficiently. Despite a strong teaching emphasis on movement skills, Jenna facilitated some tactical talk in her lessons. She asked students questions such as, "What should you have done then", "Why didn't that pass work" and shouted out constant feedback "Good work", "great pass". She seemed to have good subject knowledge about Netball and was keen to use Netball as the focus of the GCA unit to be taught.

Knowledge and Understanding of GCAs

Through our group interviews, Jenna appeared quite knowledgeable about GCAs, although confessed that she mostly taught skills and played big games. I commented on both Jenna and Sarah's knowledge in one reflection noting,

> Jenna and Sarah seem to have more understanding about TGfU and identify the traits of a GCA approach as getting the students to think for themselves and improve participation. Although, I am mindful of how much input I have had to direct them to this conclusion.
>
> (Researcher Reflective Journal, 28th March 2014)

Jenna was able to identify some benefits she perceived for the students in adopting a GCA approach, noting "I saw them having to think for themselves" (Teacher interview, 28 March 2014). Jenna appeared very keen to adopt a GCA in her teaching, although wasn't sure on how to change her practice.

Participation in the study

Jenna remained committed to the study and completed both cycles of research, although played a less active role in the planning phase (Phase A) of cycle 1 and the implementation phase (Phase B) of cycle 2 was compromised by her commitment to her Year 12's. During the planning Phase of Cycle 1 (Phase A) Jenna wasn't able to invest the originally dedicated time that they had set aside due to her senior class commitments taking precedence; leaving Sarah to do most of the unit planning on her own, as noted in the following conversation:

> Researcher: So how did you go about doing it? Were you able to do it together?
> Sarah: Um bits and pieces
> Jenna: Yeah, Sarah made a good start on it
> Researcher: Yeah
> Sarah: And then, because they [Andrew & Jenna] had some other stuff that they needed to do in that faculty time for the seniors and I didn't have that, so I got started. But yeah, ideas were flowing, and it seemed ok once I wrapped my head around it all.
>
> (Teacher interview, 1 May 2014)

Jenna was less focused during the implementation phase of Cycle 2, she often turned up to lessons unclear on what she was actually doing and admitting she hadn't looked at the lesson

plan prior to the lesson. She was often disorganised, unclear on the learning intentions and quite scattered. She had to abandon one lesson and teach something different as there was no equipment available in the store and left me to teach one lesson while she went and helped set up some equipment for her Year 12's for their 'Muck Up Day'.

Sarah

Teaching Experience

Sarah is a newly qualified PDHPE teacher, having completed her University studies two years prior to the research. She has been in a temporary position at Sample High School for the last two years. Sarah is eager to find a permanent position so that she has some job security. Sarah appears to have fitted in well with the PDHPE department and is keen to be part of the team. She takes mostly the junior classes, including Year 9 and 10 PASS classes, along with Sport. Sarah is still completing her teacher accreditation and applying for permanent jobs wherever there is an opportunity. She actively takes on wider school roles, going on school camps, organising jump rope for heart and taking on a roll call class.

Personal Setting

Sarah lives with her partner and has no children. She plays weekend Soccer at a club level. Sarah lives a fair distance from School, so arrives early to miss the rush hour traffic but needs to leave early in order to avoid traffic at the end of the day.

Current Teaching Practice

Sarah appears disheartened and disapproving of the current state of practice within the faculty but feels limited in her capacity to bring about any changes due to her lack of seniority and non-permanent position. In one conversation she notes:

Sarah: Well, I think that it is a bit different for me because I have come into a system that has been working together for 12 years and so, you know, I have just kind of filled the gap.

Researcher: Occupational socialization that's called, just adhering to what is going on.

Sarah: Yeah, but I have brought in quite a few games where I have said, like last year, I said I have got this game, do you want to learn it? I think it was the three of us on [Jenna, Barry and Sarah] and Barry is like "Really?" And I was like, "come on!" And he loves it, and he does it all the time now. But I've had to pick my moments of when to say, "do you want to try this" and, so that's what's been a bit interesting"

Sarah appeared concerned that students were not learning in their PE lessons through the current skill-based approach to teaching and the heavy emphasis placed in lessons on 'training' for the pending carnivals, noting:

Sarah: We've done it for, 6-7 weeks [Athletics unit], and they're not learning anything

Researcher: There's no learning?

SS: No, they're not learning. They're not learning anything

Researcher: We do it [teach units of work based on training for carnivals] because we have the Cross-Country carnival

Sarah: Yes, and that's the same with these Athletics skills we've been talking about

She seems exasperated by the faculty's choice to join blocked classes together and team teach, preferring to do her own thing when not grouped with the other teachers:

Sarah: well normally, year 9 and year 10 is blocked and it's the whole year group on at a time, but I'm quite – I guess I see it as fortunate – in that all my other classes in my junior years – I've got two year 7 and 1 year 8, which is now going to 1 year 7 and two year 8 but whatever – I'm not on with anyone. So, I can do things the way I want to do it and it's not you know

Researcher: Team teaching. Why do you all team-teach? What's the – there's a reason behind it?

Sarah: Probably because it's easier

Researcher: For you guys?

Sarah: Yeah

Researcher: Easier in terms of what?"

Sarah: Probably, because also, the team-teaching lessons turn in to 'here's a game, we're going to split you up into 8 teams, and you're going to do a round robin' that's what they turn in to. Because he [Barry] gets to sit and chat and not do anything.

In my lesson observation, Sarah is focused on gaining control of the class and spends a lot of time on organisation and class management. Students have limited activity time, although are

attentive and mostly well behaved. Her instructions lack clarity and students often take a while to get going on tasks.

Knowledge and Understanding of GCAs

Out of all of the faculty members, Sarah has had the most experience and education around GCAs. Her University course provided her with some insight and a few basic lessons on GCAs, although, she admits she mostly opts to teach using a skill-based approach and to join the others in team teaching and organising round robin competitions. She is keen to experiment with different teaching styles and strategies, especially if she has a class on her own. Sarah notes her previous experiences with GCA, commenting

> "In like some lessons I will do a game like approach because it is that one game I like to do, like End-ball, kind of like frisbee in a way like you have to catch a ball in the end zone and I often stop it and say 'Ok, how can we improve?' 'What is working for your team' and I ask, 'How can we improve?'. I often stop, change the ball up and do things like that and add rules as I go along and that is a very game centred approach, but I don't do that in all of my lessons. Although I know that is, what I see it as".

Participation in the study

Sarah was the driving force behind this research, being the main point of contact and liaison between the faculty and myself. She was always the most forthcoming in group interviews and very keen to be supported in her PD. She often stayed behind after lesson observations to discuss her teaching and engage in further discussion. She was motivated to change her practice and the current status quo with regard to the teaching and learning culture within the faculty. In one reflection, the research notes:

> I spent some time with Sarah on her own afterwards. She is definitely the driving force and really wants to embrace this opportunity, she questioned some of my teaching strategies and was very concerned about the need to focus on skill development. She is really concerned that I didn't actually tell the kids 'how' to execute the shotput technique and I challenge her with what the syllabus actually requires
>
> My Reflective Journal, 28th March 2014

Sarah maintained this enthusiasm and commitment to the study throughout the entire research process.

Appendix 7

7. UOW Ethics Approval Letter

In reply please quote: HE14/045

27 March 2014

Dr Dana Perlman
School of Education
Bldg 23.120
Faculty of Social Sciences
University of Wollongong NSW 2522

Dear Dr Perlman

Thank you for your response dated 18 March 2014 to the HREC review of the application detailed below. I am pleased to advise that the application has been approved.

Ethics Number: HE14/045

SERAP Number: 2014017

Project Title: Advancing the Understanding of the Complexity of Teacher Professional Learning within a Physical Education Teaching Context

Researchers: Dr Dana Perlman, Ms Kelly Ann Parry

Approval Date: 27 March 2014

Expiry Date: 26 March 2015

The University of Wollongong/Illawarra Shoalhaven Local Health District Social Sciences HREC is constituted and functions in accordance with the NHMRC *National Statement on Ethical Conduct in Human Research.* The HREC has reviewed the research proposal for compliance with the *National Statement* and approval of this project is conditional upon your continuing compliance with this document.

A condition of approval by the HREC is the submission of a progress report annually and a

final report on completion of your project. The progress report template is available at http://www.uow.edu.au/research/rso/ethics/UOW009385.html. This report must be completed, signed by the appropriate Head of School, and returned to the Research Services Office prior to the expiry date.

As evidence of continuing compliance, the Human Research Ethics Committee also requires that researchers immediately report:

- proposed changes to the protocol including changes to investigators involved
- serious or unexpected adverse effects on participants
- unforeseen events that might affect continued ethical acceptability of the project.

Please note that approvals are granted for a twelve-month period. Further extension will be considered on receipt of a progress report prior to expiry date.

If you have any queries regarding the HREC review process, please contact the Ethics Unit on phone 4221 3386 or email rso-ethics@uow.edu.au.

Yours sincerely

Professor Kathleen Clapham
Chair, Social Sciences
Human Research Ethics Committee

Appendix 8

8. State Education Research Applications Process (SERAP) Approval Letter

NSW GOVERNMENT Education & Communities

Miss Kelly Parry
3/8 Wilson Road
PENNANT HILLS NSW 2120

CORP14/5604
DOC14/142258
SERAP 2014017

Dear Miss Parry

I refer to your application to conduct a research project in NSW government schools entitled *Advancing the Understanding of the Complexity of Teacher Professional Learning within a Physical Education Teaching Context*. I am pleased to inform you that your application has been approved. You may contact principals of the nominated schools to seek their participation. **You should include a copy of this letter with the documents you send to schools.**

This approval will remain valid until 26 March 2015.

The following researchers or research assistants have fulfilled the Working with Children screening requirements to interact with or observe children for the purposes of this research for the period indicated:

Name	**Approval expires**
Kelly Ann Parry	26/02/2019.

I draw your attention to the following requirements for all researchers in NSW government schools:

- School principals have the right to withdraw the school from the study at any time. The approval of the principal for the specific method of gathering information must also be sought.
- The privacy of the school and the students is to be protected.
- The participation of teachers and students must be voluntary and must be at the school's convenience.
- Any proposal to publish the outcomes of the study should be discussed with the research approvals officer before publication proceeds.

When your study is completed please email your report to: serap@det.nsw.edu.au.

You may also be asked to present on the findings of your research.

I wish you every success with your research.

Yours sincerely

Dr Susan Harriman
Leader, Quality Assurance Systems
31 March 2014

Policy, Planning and Reporting Directorate
NSW Department of Education and Communities
Level 1, 1 Oxford Street, Darlinghurst NSW 2010 – Locked Bag 53, Darlinghurst NSW 1300
Telephone: 02 9244 5060 – Email: serap@det.nsw.edu.au

Appendix 9

9. Participant Information Letter

Advancing the Understanding of the Complexity of Teacher Professional Learning within a Physical Education Teaching Context

INFORMATION SHEET FOR TEACHERS

***What is* 'Advancing the Understanding of the Complexity of Teacher Professional Learning within a Physical Education Teaching Context' research project?**

This project is a study of the implementation of game-centred pedagogies (such as TGfU) and how best to support teachers to implement game-centred pedagogies to ensure quality outcomes for their students. The University of Wollongong will conduct the study.

What is the purpose of this project?

The research team will identify an approach that can be used by teachers to support the implementation of GCAs for themselves and others that is teacher-led, sustainable and needs based. The goal of this project is to develop a model of professional development that sets out to empower teachers and have them address the key constraints in their own school settings. The benefits of this study will be provided through ongoing support for the implementation of game-centred approaches.

What is expected of you in the study?

If you volunteer to be involved in this study, you will be involved in two cycles of action research and required to:

- Participate in weekly Teacher Interviews/Focus group interviews
- Participate in weekly Teacher Reflections
- Collaboratively plan and revise units/lessons
- Have a researcher observe your weekly lessons

What is action research?

Action research is a cyclical process where the researcher(s) and participants are engaged in the continuous practice of reflection and adaptation. It involves the ongoing process of:

1. Planning: develop a plan for implementing game centred approaches,
2. Acting: implement the plan,
3. Observing: observe and document the effects of the plan and
4. Reflecting: reflect on the effects of the plan for further planning and informed action

The research process:

There are 4 phases to the research process:

1. Phase A: Introductory Workshop – Needs Assessment
2. Phase B: Planning/Designing and Phase B: Revise Planning
3. Phase C: Implementation and Implementation Support
4. Evaluation

Phase A: Introductory Workshop – Needs Assessment
Term 1, 2014 Week 9 - Week 10 (31st Mar – 11 April)
Data Source: *Teacher Source: Interview/Focus Group Interview, Document Source: Document analysis, Teacher Reflection/Evaluation, Focus Group Interview*
Aim of Phase A: 1. ***Teacher/Focus Group Interviews -*** identify what pre-existing knowledge of GCAs teachers have and what Professional Learning they need 2. ***GCA workshop -*** the workshop will be conducted by one of the GCA 'experts', who is familiar with both the GCA approach and the challenges of implementing GCAs in school setting. 3. ***Teacher/Focus Group Interviews -*** following the GCA workshop, open-ended questions will be used to ask teachers about their perceptions of learning during the GCA workshop The GCA workshop will be designed using a team of GCA 'experts', in consultation with the teacher participants, following a needs assessment to identify what pre-existing knowledge of GCAs teachers have and what Professional Learning they need. The needs

assessment will be administered through a focus group interview where teachers discuss their professional learning needs.

Examples of questions include:

- What do you currently understand/know about GCAs?
- What experiences have you had with implementing GCAs in your teaching practice?
- What GCA professional learning are you aware of/have you taken part in?
- What professional development will help you to implement GCAs?
- What contextual issues do you think will challenge you in implementing GCAs?
- What will help you to implement GCAs?

The GCA workshop will also be designed based upon previously identified features of high-quality Professional Development identified in the literature (Document Source); including a focus on developing content knowledge, active learning and situated practice. The workshop will be conducted by one of the GCA 'experts', who is familiar with both the GCA approach and the challenges of implementing GCAs in school setting.

Following the GCA workshop, open-ended questions will be used to ask teachers about their perceptions of learning during the GCA workshop.

Example questions to be used are:

- What is your understanding of the purpose/s of the GCA curriculum from today's workshop?
- After today's workshop what element(s) of the GCA model do you now feel most comfortable in implementing at your school site

- What do you need to support your planning within GCAs?

Phase B: Planning/Designing and Phase B: Revise Planning

Cycle 1 **Term 1, 2014** Week 9 -10 (31st March – 11th April)

Cycle 2 **Term 2, 2014** Week 9 -10 (16th June – 27th June)

Data Source: *Unit Plan, Lesson Plans and Teacher Reflection, Teacher Interview/Focus Group Interview*

Research Process:

1. **GCA unit and lesson plans -** submit their GCA unit and lesson plans to be coded and analysed
2. **Revise Unit/Lesson Plans -** Once the unit and lesson plans have been coded and analysed, they will be returned to the teachers to inform them of how their planning aligned with the benchmarks, and for subsequent revisions to be made.
3. **Teacher interviews -** discuss this planning phase and respective revisions

During this phase of data collection, the teachers will be required to submit their GCA unit and lesson plans to be coded and analysed. The GCA benchmark observational instrument will be used to code unit and lesson plans.

Once the unit and lesson plans have been coded and analysed, they will be returned to the teachers to inform them of how their planning aligned with the benchmarks, and for subsequent revisions to be made. Teacher interviews will be conducted to discuss this planning phase and respective revisions. Questions will be asked to determine teachers' reason for the selection, inclusion and exclusion of GCA elements within their unit/lesson plans and the subsequent changes they will make and what do you need to support your implementation of GCAs? These interviews will be transcribed and coded.

Data collected within Phase B of the study will be used to address the Level II analysis question, what is the influence of Professional Learning on the planning of GCAs?

Phase C: Implementation and Implementation Support

Cycle 1 **Term 2, 2014** Week 1 - Week 10 (28th April – 27th June) ***Cycle 2*** **Term 3, 2014** Week 1 - Week 10 (14th July – 19th September)
Data Source: Lesson Observation, Teacher Reflection and *Teacher Interview/Focus Group Interview*
Research Process: 1. **Lesson Observations -** the GCA benchmark observational instrument will be used to code teacher GCA pedagogical behaviour. 2. **Teacher Reflections -** teachers will also be required to submit their lesson reflections for analysis 3. **Teacher Interview/Focus Group Interview -** teacher interviews will be conducted to inform teachers of how their lessons aligned with the benchmarks and to find out what teachers need to support them through this implementation stage During this phase of the data collection, teachers' GCA lessons will be observed and videotaped at the school site. The GCA benchmark observational instrument will be used to code teacher GCA pedagogical behaviour. Teachers will also be required to submit their lesson reflections for analysis, these will be transcribed and coded. Teacher interviews will be conducted to inform teachers of how their lessons aligned with the benchmarks and to find out what teachers need to support them through this implementation stage. These will be transcribed and coded. *The data obtained from observational coding of teacher behaviour and the teacher interviews during phase C will be used to address the Level III analysis question, what is the influence of Professional Learning on the Implementation of GCAs?*

Evaluation
Term 3, 2014 Week 10 (15th – 19th September)
Data Source: *Teacher Interview*
Research Process:

Teacher Interview - each participant will be interviewed regarding their perceptions of PD learning and the unit of GCA they delivered

After the completion of the school GCA unit, each participant will be interviewed regarding their perceptions of PD learning and the unit of GCA they delivered. These interviews will be conducted by the primary researcher in an individual face-to-face format over a period of 20 min. Questions focused on the teachers' implementation of the model and their rationales for their practices. Examples of questions posed included, what elements of the GCA model did you use in your unit? And what barriers did you face in implementing the GCA unit?

Data obtained from Phase E were used to address the Level II and III analysis questions: What is the influence of Professional Learning on the planning of GCAs? And what is the influence of Professional Learning on the Implementation of GCAs?

When will the study take place?

The study will take place over four phases and will potentially include 2 cycles of research, as per the action research framework (Plan, act, observe, reflect).

Phase of Data Collection	Purpose	Data Source	Timeframe
Phase A:	Needs Assessment	• Teacher Source: Interview/Focus Group Interview • Document Source: Document analysis	**Term 1, 2014** Week 9 - Week 10 (31st Mar – 11 April)
	Introductory Workshop	• Teacher Reflection/Evaluation • Focus Group Interview	
Phase B:	Planning/Designing	• Unit Plan • Lesson Plans	***Cycle 1*** **Term 1, 2014** Week 9 -10 (31st March – 11th April) ***Cycle 2*** **Term 2, 2014** Week 9 -10 (16th June – 27th June)
	Revise Planning	• Teacher Reflection • Teacher Interview/Focus Group Interview	
Phase C:	Implementation	• Lesson Observation • Teacher Reflection	***Cycle 1*** **Term 2, 2014**

	Implementation Support	• Teacher Interview • Focus Group Interview	Week 1 - Week 10 (28th April – 27th June) ***Cycle 2*** **Term 3, 2014** Week 1 - Week 10 (14th July – 19th September)
Evaluation	Evaluation of Professional Learning	• Teacher Interview	**Term 3, 2014** Week 10 (15th – 19th September)

What is expected of each research participant?

Phase of Research (Phase a, B, C, D)	**Type of activity** *(e.g. survey, interview, video observation)*	**Participants in each school** *(number & type) (e.g. 50 yr. 3 students, 2 teachers)*	**Amount of time activity will take** *(e.g. 30 mins)*	**When activity will take place** *(e.g. in class time, Term 2 2008)*	**Classes** *(number & year levels) (e.g. 5 [yr. 3])*	**Participation strategy** *(e.g. whole class/students withdrawn from class)*
Phase A: Introductory Workshop – Needs Assessment	Teacher Interviews Focus Group Interviews	All Participants i.e. entire faculty or individual teacher(s) within faculty	Teacher: **20 min each * 1 week** Focus group: **1 hour a week * 2 weeks**	**Term 1, 2014** Week 9 - Week 10 (31st Mar – 24th March)	No student involvement	Individual teacher interview & Focus group interview *Conducted during teacher allocated time

	GCA workshop	All Participants i.e. entire faculty or individual teacher(s) within faculty	**2 * half day workshops**	**Term 1, 2014** Week 9 - Week 10 (31st March – 11 April)	No student involvement	Whole faculty Onsite, withdrawn from timetable *Conducted during teacher allocated time
	Teacher Interviews Focus Group Interviews	All Participants i.e. entire faculty or individual teacher(s) within faculty	Teacher: **20 min each** Focus group: **1 hour**	**Term 1, 2014** Week 10 (7th April – 11th April)	No student involvement	Individual teacher interview & Focus group interview *Conducted during teacher allocated time
Phase B: Planning/ Designing and Phase B: Revise Planning	GCA unit and lesson plans	All Participants i.e. entire faculty or individual teacher(s) within faculty	At participants leisure over a **2-week period** Repeated for 2nd research cycle	**Term 1, 2014** Week 9 - 10 (31st March – 11th April) **Term 2, 2014** Week 9 - 10 (16th June – 27th June)	No student involvement	Collaborative and individual planning *Conducted during teacher allocated time

	Revise Unit/Lesson Plans	All Participants i.e. entire faculty or individual teacher(s) within faculty	**At participants leisure over a 2-week period** Repeated for 2nd research cycle	**Term 1, 2014** Week 9 - 10 (31st March – 11th April) **Term 2, 2014** Week 9 - 10 (16th June – 27th June)	No student involvement	Collaborative and individual planning *Conducted during teacher allocated time
	Teacher Interviews Focus Group Interviews	All Participants i.e. entire faculty or individual teacher(s) within faculty	Teacher: **20 mins a week * 2 weeks** Focus group: **1 hour a week * 2 weeks** Repeated for 2nd research cycle	**Term 1, 2014** Week 9 - 10 (31st March – 11th April) **Term 2, 2014** Week 9 - 10 (16th June – 27th June)	No student involvement	Individual teacher interview & Focus group interview *Conducted during teacher allocated time
Phase C: Implementation and Implementation Support	Lesson Observations	All Participants i.e. entire faculty or individual teacher(s) within faculty	Observation takes place each time the teacher has the class e.g. 1 * **1 hr/wk. or 2 * 1 hr/wk. * 10 weeks** Repeated for 2nd research cycle	**Term 2, 2014** Week 1 - Week 10 (28th April – 27th June) **Term 3, 2014** Week 1 - Week 10 (14th July – 19th September)	1 class per teacher Stage 5, Year 9/10 13 classes in total	Individual teacher observation *Conducted with chosen class

	Teacher Reflections	All Participants i.e. entire faculty or individual teacher(s) within faculty	Reflections take place after each lesson e.g. 1 *** 1 hr/wk. or 2 * 1 hr/wk. * 10 weeks** Reflections take 15 mins Repeated for 2nd research cycle	**Term 2, 2014** Week 1 - Week 10 (28th April – 27th June) **Term 3, 2014** Week 1 - Week 10 (14th July – 19th September)	No student involvement	Individual teacher reflection *Conducted during teacher allocated time
	Teacher Interview/ Focus Group Interview	All Participants i.e. entire faculty or individual teacher(s) within faculty	Teacher: **20 min each * 10 week** Focus group: **1 hour a week * 10 weeks** Repeated for 2nd research cycle	**Term 2, 2014** Week 1 - Week 10 (28th April – 27th June) **Term 3, 2014** Week 1 - Week 10 (14th July – 19th September)	No student involvement	Individual teacher interview & Focus group interview *Conducted during teacher allocated time
Evaluation	Teacher Interview	All Participants i.e. entire faculty or individual teacher(s) within faculty	Teacher: **20 min each** Focus group: **1 hour a week**	**Term 3, 2014** Week 10 (15th – 19th September)	No student involvement	Individual teacher interview & Focus group interview *Conducted during teacher allocated time

There are no foreseeable burdens or risks to you beyond the time involved in participation.

You are free to refuse participation or withdraw yourself from the study or withdraw information at any time. We ask that withdrawing from the study be done either verbally or through a written letter to the lead researcher (Kelly Ann Parry) indicating your desire to withdraw yourself from the study. In addition, refusal or withdrawing from this project will have no impact on your relationship with the Researcher, the University or your position in the school.

The results of this study may be published; however, the identity of participants will not be revealed. Access to all data will be restricted to the researcher(s) participating in the study.

This study has been reviewed by the Human Research Ethics Committee of the University of Wollongong. If you have any concerns or complaints regarding the way this research has been conducted, you can contact the UoW Ethics Officer on (02) 4221 4457 or rso-ethics@uow.edu.au

Thank you for your assistance

Dr. Dana Perlman, Senior Lecturer	dperman@uow.edu.au;	4221 3885
Miss Kelly Parry, Lecturer/HDR Student	kparry@uow.edu.au;	4221 4178

Appendix 10

10. Participant Consent Form

Advancing the Understanding of the Complexity of Teacher Professional Learning within a Physical Education Teaching Context

TEACHER CONSENT FORM

I have received the information about the project titled: **'Advancing the Understanding of the Complexity of Teacher Professional Learning within a Physical Education Teaching Context'** and have been able to talk about this with the researcher(s).

I understand that if I decide to be involved in this project, I need to complete the following during the 2014 academic year:

- Participate in weekly Teacher Interviews/Focus group interviews
- Participate in weekly Teacher Reflections
- Collaboratively plan and revise units/lessons
- Have a researcher observe your lessons

*I understand that this project will commence during **Term 1**, 2014 (31st March) and will continue throughout **Term 2** (28th April – 27th June) and **Term 3** (14th July – 19th September).*

I have been told that there are no foreseeable risks and no burdens beyond the time involved in participation. I am free to refuse participation and withdraw myself from the study or withdraw information from the study at any time. To withdraw my information, I can either verbally or through a written letter indicate my desire to withdraw from the study. My refusal to participate or withdraw consent will not affect my relationship with my school, the University or the researcher(s) of the project.

I understand the results of this study may be published and presented at research conferences; however, the identity of participants will not be revealed.

I agree for it to be used in this way.

I understand that the researchers conducting this study have my protection, interests and safety as their first priority at all times. Your signature below indicates:

1. You have read the information provided about this project;
2. You can clearly understand the procedures;
3. You voluntarily agree to participate in the project and understand that you may withdraw at any time.

I (name) _____ agree to take part in the study titled: 'Advancing the Understanding of the Complexity of Teacher Professional Learning within a Physical Education Teaching Context' *Research Project.*

Surname: _____ Given name: _____

Date: _____ 2014

Thank you for your assistance

Dr. Dana Perlman, Senior Lecturer	dperman@uow.edu.au;	4221 3885
Miss Kelly Parry, Lecturer/HDR Student	kparry@uow.edu.au;	4221 4178

Appendix 11

11. Unit Plan Template

Overview:

Unit Title		**Year**	
Unit Length		**Students**	
Length of Class		**Facilities**	
Topics		**Resources**	

Major Outcomes:

Knowledge and Understanding *(PDHPE Syllabus, pg. 13)*	**Skills** *(PDHPE Syllabus, pg. 14)*	**Values** *(PDHPE Syllabus, pg. 12)*

Evidence of Learning	**Assessment Activities**

Learn About *(PDHPE Syllabus, pg. 25-26 and/or pg. 31-32)*	**Learn To** *(PDHPE Syllabus, pg. 25-26 and/or pg. 31-32)*	**Tactical Problem**	**Learning/Assessment Activities**

Appendix 12

12. Lesson plan template

Date:		**Unit:**		**Venue:**	
Class:		**No. of students:**		**Lesson #:**	

Outcomes:
Syllabus Outcomes:
Knowledge & Understanding *(PDHPE Syllabus, pg. 13)**:***
Skills *(PDHPE Syllabus, pg. 14)**:***
Values *(PDHPE Syllabus, pg. 12)**:***

Learning Intentions:
CONCEPTS TO BE DEVELOPED: Students learn about… *(PDHPE Syllabus, pg. 25-26 and/or pg. 31-32)*
OBJECTIVES/SKILLS TO BE DEVELOPED: Students learn to… *(PDHPE Syllabus, pg. 25-26 and/or pg. 31-32)*

ASSESSMENT: *How will I know students have met the Learning Intention? How will the students know they have met the Learning Intention?*	***STRATEGICAL PROBLEM***
RESOURCES:	***FOCUS QUESTIONS***
SAFETY:	

LESSON ACTIVITIES	Time	TEACHING CONSIDERATIONS	What are the students doing?
List teaching strategies with times		Include a brief description of teaching and learning strategies, organisation, management and safety considerations. Diagrams will be needed for practical lessons. Teacher does:	Include suggested answers from students to questions/responses. Students will do:
1. Warm up Activity/Instant Activity:			

2. Identifying and solving tactical problems:			
3. Game form 1 (situated learning task):			
4. Identifying and solving tactical problems:			
5. Game form 2 (situated learning task):			
6. Identifying and solving tactical problems			
7. Conclusion:			

Appendix 13

13. Sample Interview Questions

Questions:
Theme: Pre-existing knowledge do teachers have in relation to GCAs? 1. What VALUE do you see in implementing GCAs? **Theme: Modified Games and Questioning? (Fred)** 2. What do these modified games look like? 3. What sort of questioning? **Theme: Move from mass practice (Barry)** 4. Why do we move away from mass practice? 5. What value is there in doing this? **Theme: Invasion Games – Game Categories (Sarah)** 6. What other games categories are there? 7. Why does a GCA approach use games categories? 8. What is the value of teaching in games categories?

Theme: Issues with implementation (Programming, staffing issues, student attributes, teacher inexperience with GCA, timetable constraints)

9. How can we address these?

Theme: Students

Year 9 are more suitable students for this approach

10. Why do you see these attributes as important for implementing a GCA approach?

Theme: Significance of GCAs in PE here in NSW?

11. What is the significance of using a GCA approach here in NSW

Theme: Role of the teacher in GCAs?

12. What do you think the role of the teacher is when implementing a GCA approach (Planning, delivering, assessing)

Theme: Needs/Wants - Observe a lesson

13. What lesson – why?

14. What do you think needs to be included in this lesson?

15.Where do we then go from there?

Theme: Planning - Lesson Plans and Units of Work

16. Once I give you these, what do you think then needs to happen?

17. How are we going to go about planning?

18. What are we going to plan?

Planning needs to be collaborative

19. How do you see this working

Theme: Time is a factor

20. How can we make time?

Theme: Resources

21. How are you going to use these?

22. What are you going to do once you have these resources?

Theme: Next steps

Appendix 14

14. Interview protocol (adapted from Creswell, 2013)

No.		**Date:**		**Venue:**	
Phase				**Duration:**	
Media File (link to recording of interview)					
Interviewer					
Interviewees					
Setting					
Identified Themes					
Questions:					

Appendix 15

15. Researcher Developed Teacher Assessment Scaffold

Task: Observe students in a 5 v 5 **GAME**. Score students **game performance** on a 5 -1 continuum based on their **appropriate** and **inappropriate**: **DECISION MAKING, SKILL EXECUTION and SUPPORT** within the game.

Outcomes:	**Knowledge and Understanding Outcomes:** ● **5.4** adapts, transfers and improvises movement skills and concepts to improve performance **Skill Outcomes:** ● **Decision-making (5.12):** adapts and applies decision making processes and justifies their choices in increasingly demanding contexts ● **Moving (5.14):** confidently uses movement to satisfy personal needs and interests

Components:

Decision Making: Making appropriate decisions about what to do off the ball (in defense) during the game

I = Inappropriate	A = Appropriate
Not passing when needed, **not** backing teammates up, **not** passing to the open player/space	**Passing** when needed, **passing** to an open player, **utilizing** the open space, **backing** each other up, playing offence on/off the ball

Skill Execution: Efficient execution of the selected skills.

I = Inappropriate	A = Appropriate
Doesn't execute the pass successfully, **doesn't** make a successful pass, pass gets **intercepted**	**Executes** the pass successfully, makes a **successful** pass, pass **doesn't** get intercepted

Support: Appropriately supporting teammate with ball by being in a position to receive a pass

I = Inappropriate	A = Appropriate
Doesn't attempts to move into a position to receive a pass from a teammate, **doesn't** move forward to space after the pass is made, **doesn't** position self in passing lane, **doesn't** moving quick and calling for the ball	Attempts to move into a position to receive a pass from a teammate, moving forward to space after the pass is made, positioning self in passing lane, moving quick and calling for the ball

Scoring Key:

5	4	3	2	1
Very effective performance (Always)	Effective performance (Usually)	Moderately effective performance (Sometimes)	Weak performance (Rarely)	Very weak performance (Always)

	Name	Decision Making	Skill Execution	Support
e.g.	Joe Blogs	3	3	5

1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16	Add rows as needed.			

Appendix 16

16. Researcher Developed Peer Assessment Scaffolds

Task: Observe your buddy's game performance in a small-sided '5 v 5' **GAME**. Make a tally of the **appropriate** and **inappropriate** **SUPPORT** made.

My buddy was:		**My Name is:**	

Outcomes:	**Knowledge and Understanding Outcomes:** • **5.4** adapts, transfers and improvises movement skills and concepts to improve performance **Skill Outcomes:** • **Decision-making (5.12):** adapts and applies decision making processes and justifies their choices in increasingly demanding contexts • **Moving (5.14):** confidently uses movement to satisfy personal needs and interests

What to look for:
Support - Students should attempt to move into a position to receive a pass from a teammate

Appropriate Support
• Moving forward to space after the pass is made • Positioning self in passing lane • Moving quick and calling for the ball

Recording directions
• Read the three previous points about good support • Use a tally to mark each players attempt to support during the game

Appropriate *(Tally)*	**Inappropriate** *(Tally)*

Provide some feedback and suggested improvements for your partner:

Positive Feedback:

Things to improve on:

Signed:	

Appendix 17

17. Sample Lesson Plan

<table>
<tr>
<td>Date:</td>
<td>__ / __ / __

Week 3</td>
<td>Unit:</td>
<td>Invasion Games:

Application:
• Jenna: Netball/Basketball</td>
<td>Venue:</td>
<td>• Jenna: Netball/Basketball
• Fred: Touch
• Sarah: Soccer</td>
</tr>
</table>

			• **Fred:** Touch • **Sarah:** Soccer		
Class:	Year 9 • **Jenna:** • **Fred:** • **Sarah:**	**No. of students:**	• **Jenna:** • **Fred:** • **Sarah:**	**Lesson #:**	**1** of 7

Outcomes:
Syllabus Outcomes:
Knowledge & Understanding *(PDHPE Syllabus, pg. 13):*
• **5.4:** adapts, transfers and improvises movement skills and concepts to improve performance
Skills *(PDHPE Syllabus, pg. 14):*
• **Decision-making (5.12):** adapts and applies decision making processes and justifies their choices in increasingly demanding contexts

Learning Intentions:
CONCEPTS TO BE DEVELOPED: Students learn about… *(PDHPE Syllabus, pg. 25-26 and/or pg. 31-32)*

• **aspects of movement skill development**
  ○ body control and awareness
  ○ object manipulation and control
  ○ **anticipation and timing**
  ○ **technique**
• **influences on skill development and performance**
  ○ **transfer of skills and concepts**
  ○ learning environments
  ○ feedback

- **Moving (5.14):** confidently uses movement to satisfy personal needs and interests

Values *(PDHPE Syllabus, pg. 12)**:***

    - importance of practice
    - safety
    - the role of rules and regulations in safe participation

OBJECTIVES/SKILLS TO BE DEVELOPED: Students learn to…
(PDHPE Syllabus, pg. 25-26 and/or pg. 31-32)

- demonstrate movement skills in increasingly complex and challenging activities from a selection of the following contexts:
    - games
- adapt, transfer and improvise movement in increasingly demanding contexts, eg varying space, rules, equipment and apparatus, time restrictions and rhythm
- design and participate in modified activities to improve performance and promote safe participation in increasingly complex and challenging situations
- experiment with the application of simple mechanical principles to enhance performance and ensure safety, eg modify body position and technique

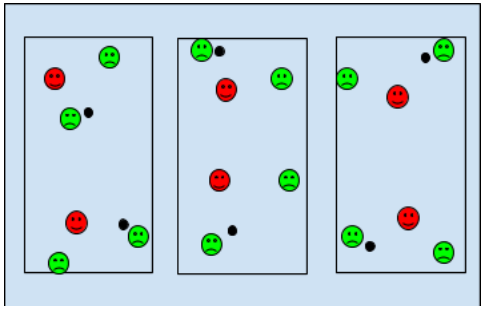
ASSESSMENT: *How will I know students have met the Learning Intention? How will the students know they have met the Learning Intention?*

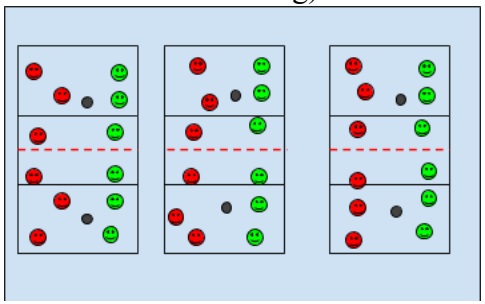
STRATEGICAL PROBLEM

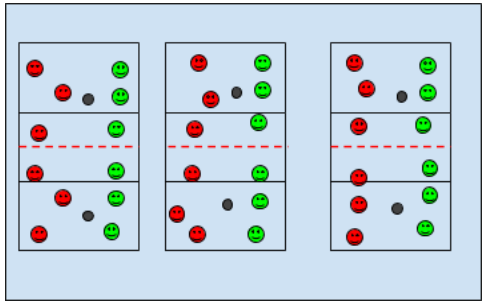
Scoring and maintaining possession: ***How do you maintain possession of the ball?***

Students will be able to maintain possession of the ball and execute an effective/successful pass to set up an attacking opportunity to score	ɔnsidering the importance of an overlap and having a target ɣer to pass to)
ESOURCES:	***FOCUS QUESTIONS***
	1. How do we maintain possession? 2. How do we invade the territory? 3. How do we score/pass?
SAFETY:	

LESSON ACTIVITIES	Time	TEACHING CONSIDERATIONS	What are the students doing?
List teaching strategies with times		Include a brief description of teaching and learning strategies, organisation, management and safety considerations. Diagrams will be needed for practical lessons. Teacher does:	Include suggested answers from students to questions/responses. Students will do:

1. Warm up Activity/Instant Activity:		**2V1 – Possession game:** Students make 5 passes to score with no set boundary (Highlight the overlap and target player) **Primary rules** • Can't move with the ball • Can't replay the ball • No body contact/obstruction **Secondary Rules:** • No goals - 5 passes = a goal • Can hold the ball for 5 seconds instead of 3 (Increase ball possession to 5 seconds to allow more time for decision making) 	• Maintain possession of the ball • Pass the ball to the open player or to space • Moving off the ball to support the ball carrier
2. Identifying and solving tactical problems:		**Questions and feedback** • Where are you going to receive the ball? • Where are you going to pass the ball? • How are you going to pass the ball? • What influences your decision? • How does this activity replicate a game scenario?	**What to look for?** • Students are varying the passes • Moving into to space to receive the ball • Passing to the space and not just to player • Breaking away from defenders

3. Game form 1 (situated learning task):		**3V3 scoring in a hoop at the end zone:** Join each group and verse another group **Scoring:** provide a target (hoop) **Area:** 1/3 of court to allow more space to experience success **Primary rules** • Can't move with the ball • Can't replay the ball • No body contact/obstruction **Secondary Rules:** • No goals - 5 passes = a goal • Can hold the ball for 5 seconds instead of 3 (Increase ball possession to 5 seconds to allow more time for decision making) 	• Students maintaining possession of the ball • supporting the ball carrier • setting up attacking opportunities • Students using a variety of passes including long passes, short passes etc
4. Identifying and solving tactical problems:		**Questions and feedback** • How do we move to create or receive a pass? • How does your passing change with more defenders and less options? • How do we set up an attacking play?	**What to look for?** • Students breaking away • Signals of where they are going to move to • Player with the ball make the best choice making a successful pass

5. Game form 2 (situated learning task):		**3V3:** – individual modification for successful and unsuccessful attacks/keeping possession) **Secondary rules** • Make the scoring area smaller or larger • Make the playing area smaller or larger • Limit the movement of the defender (can't be within 2m of the attacking person, defend the space only) Limit the passing options (can't pass the ball to the person you received it from) 	• Students are able to identify factors that will support and hinder keeping possession of the ball
6. Identifying and solving tactical problems		**Questions and feedback** • How can you use the space to help you maintain possession of the ball?	• Students recognise that more space = easier to keep possession

7. Conclusion:		**Focus Questions:** 1. How do we maintain possession? 2. How do we invade the territory? 3. How do we score/pass?	• Creating overlaps • Using the space

Appendix 18

18. Researcher Reflection Journal Proforma

My Reflective Journal

Date:		**Time:**		**Venue:**	

Subject (Object of inquiry)	

Reflection
Thoughts:
Observations:

Appendix 19

19. Amended Post Teaching Reflection Analysis (PTRA) Scaffold with 'Tactical Games Teacher Benchmarks' Analysis Added.

Date:		**Time:**		**Class:**	

Activity:		**Venue:**	

Lesson Observation: (Video link)	

1. What were your goals for the lesson?
For you as a teacher:
For your pupils:
2. What did you see in your lesson that you met your goals? Be specific.
For you as a teacher:
For your pupils:
3. What were the most positive aspects of the class?
For you as a teacher:
For your pupils:

4. What aspects did you feel did not go well?
5. What changes would you make to the lesson the next time you teach it?
6. Learning Outcomes: Did you see learning occur? Specifically what?
7. What are your specific goals for the next lesson? What strategies will help you achieve your goals?
Teacher goals:
Pupil Goals:

Feedback

Observational Benchmark Tool: Year 9 Invasion Games Unit

Benchmark Element	**LP 1**	**RLP 1**	**LO 1**
Creating a tactical problem as the organising centre for learning tasks,			
Teacher begins unit segment with a game form to assess student knowledge,			
Teacher identifies needed tactical and skill areas from game form,			
Teacher uses deductive questions to get students to solve the tactical problem,			

Teacher uses clear communications for situated learning tasks,			
Teacher uses high rates of guides and feedback during situated learning tasks			
Teacher provides a review that includes the tactical problems of the lesson.			
Assessment.			

Benchmark Elements: Comments

Strengths:

Areas of Improvement:

Notes:

Appendix 20

20. Unit Plan and Lesson Plans Coded Using the Observational Benchmark Tool

Sample High School Observational Benchmark Tool: Year 9 Invasion Games Unit [Term 2 2014: Cycle 1: Jenna]

Teacher Name:	Jenna

Benchmark Element	Unit Plan	LP1	LO1	LP2	LP3	LO3	LP4	LP5	LO5
1. Creating a tactical problem as the organising centre for learning tasks,	√	√	√	√	√	-	√	√	x
2. Teacher begins unit segment with a game form to assess student knowledge,	√	√	√	√	√	√	√	√	√
3. Teacher identifies needed tactical and skill areas from game form,	x	√	√	√	√	-	√	x	x
4. Teacher uses deductive questions to get students to solve the tactical problem,	x	√	√	√	√	-	√	x	x
5. Teacher uses clear communications for situated learning tasks,	x	x	√	x	x	-	x	x	√

6. Teacher uses high rates of guides and feedback during situated learning tasks	x	x	-	x	x	√	x	x	x
7. Teacher provides a review that includes the tactical problems of the lesson.	x	x	-	x	x	√	x	x	√
8. Assessment.	x	x	-	x	x	x	x	√	√

LP = Lesson Plan, RLP = Revised Lesson Plan, LO = Lesson Observation, √ = element present, - = element present but to a lesser degree

Sample High School Observational Benchmark Tool: : Year 9 Invasion Games Unit [Term 2 2014: Cycle 1: Sarah]

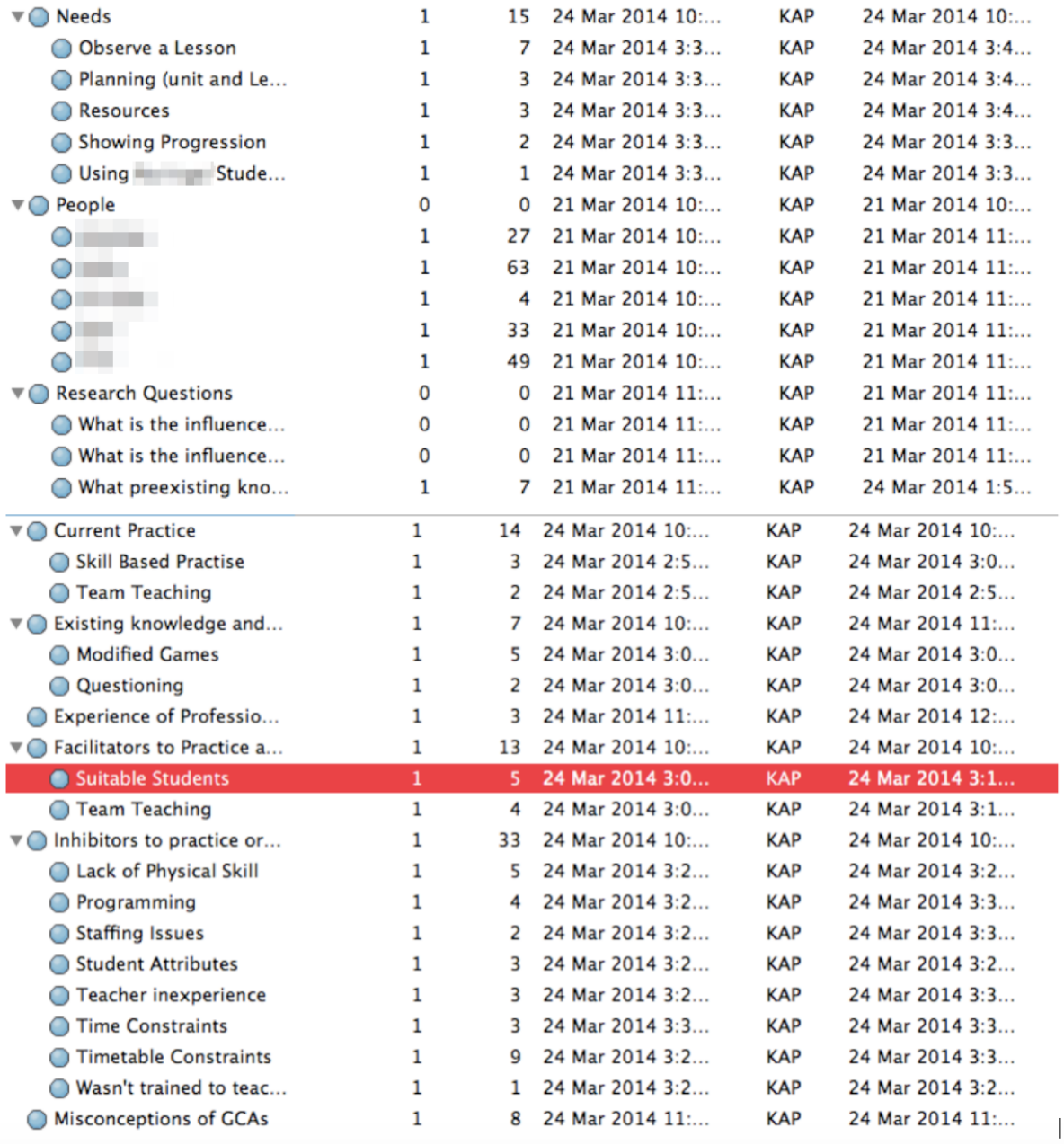
Teacher Name:	Sarah

Benchmark Element	Unit Plan	LP 1	LO 1	LP 2	LP 3	LO 3	LP 4	LO 4	LP 5	RLP 5	LO 5
1. Creating a tactical problem as the organising centre for learning tasks,	√	√	√	√	√	x	√	x			
2. Teacher begins unit segment with a game form to assess student knowledge,	√	√	√	√	√	√	√	√			
3. Teacher identifies needed tactical and skill areas from game form,	x	√	-	√	√	x	x	x			
4. Teacher uses deductive questions to get students to solve the tactical problem,	x	√	-	√	√	-	x	x			
5. Teacher uses clear communications for situated learning tasks,	x	x	-	x	x	-	x	x			
6. Teacher uses high rates of guides and feedback during situated learning tasks	x	x	-	x	x	-	x	x			
7. Teacher provides a review that includes the tactical problems of the lesson.	x	x	-	x	x	-	x	x			
8. Assessment.	x	x	-	x	x	-	√	√			

LP = Lesson Plan, RLP = Revised Lesson Plan, LO = Lesson Observation, √ = element present, - = element present but to a lesser degree, x = element not present

Appendix 21

21. NVIVO Sample (initial round of analysis)



Needs	1	15	24 Mar 2014 10:...	KAP	24 Mar 2014 10:...
Observe a Lesson	1	7	24 Mar 2014 3:3...	KAP	24 Mar 2014 3:4...
Planning (unit and Le...	1	3	24 Mar 2014 3:3...	KAP	24 Mar 2014 3:4...
Resources	1	3	24 Mar 2014 3:3...	KAP	24 Mar 2014 3:4...
Showing Progression	1	2	24 Mar 2014 3:3...	KAP	24 Mar 2014 3:3...
Using [redacted] Stude...	1	1	24 Mar 2014 3:3...	KAP	24 Mar 2014 3:3...
People	0	0	21 Mar 2014 10:...	KAP	21 Mar 2014 10:...
[redacted]	1	27	21 Mar 2014 10:...	KAP	21 Mar 2014 11:...
[redacted]	1	63	21 Mar 2014 10:...	KAP	21 Mar 2014 11:...
[redacted]	1	4	21 Mar 2014 10:...	KAP	21 Mar 2014 11:...
[redacted]	1	33	21 Mar 2014 10:...	KAP	21 Mar 2014 11:...
[redacted]	1	49	21 Mar 2014 10:...	KAP	21 Mar 2014 11:...
Research Questions	0	0	21 Mar 2014 11:...	KAP	21 Mar 2014 11:...
What is the influence...	0	0	21 Mar 2014 11:...	KAP	21 Mar 2014 11:...
What is the influence...	0	0	21 Mar 2014 11:...	KAP	21 Mar 2014 11:...
What preexisting kno...	1	7	21 Mar 2014 11:...	KAP	24 Mar 2014 1:5...
Current Practice	1	14	24 Mar 2014 10:...	KAP	24 Mar 2014 10:...
Skill Based Practise	1	3	24 Mar 2014 2:5...	KAP	24 Mar 2014 3:0...
Team Teaching	1	2	24 Mar 2014 2:5...	KAP	24 Mar 2014 2:5...
Existing knowledge and...	1	7	24 Mar 2014 10:...	KAP	24 Mar 2014 11:...
Modified Games	1	5	24 Mar 2014 3:0...	KAP	24 Mar 2014 3:0...
Questioning	1	2	24 Mar 2014 3:0...	KAP	24 Mar 2014 3:0...
Experience of Professio...	1	3	24 Mar 2014 11:...	KAP	24 Mar 2014 12:...
Facilitators to Practice a...	1	13	24 Mar 2014 10:...	KAP	24 Mar 2014 10:...
Suitable Students	1	5	24 Mar 2014 3:0...	KAP	24 Mar 2014 3:1...
Team Teaching	1	4	24 Mar 2014 3:0...	KAP	24 Mar 2014 3:1...
Inhibitors to practice or...	1	33	24 Mar 2014 10:...	KAP	24 Mar 2014 10:...
Lack of Physical Skill	1	5	24 Mar 2014 3:2...	KAP	24 Mar 2014 3:2...
Programming	1	4	24 Mar 2014 3:2...	KAP	24 Mar 2014 3:3...
Staffing Issues	1	2	24 Mar 2014 3:2...	KAP	24 Mar 2014 3:3...
Student Attributes	1	3	24 Mar 2014 3:2...	KAP	24 Mar 2014 3:2...
Teacher inexperience	1	3	24 Mar 2014 3:2...	KAP	24 Mar 2014 3:3...
Time Constraints	1	3	24 Mar 2014 3:3...	KAP	24 Mar 2014 3:3...
Timetable Constraints	1	9	24 Mar 2014 3:2...	KAP	24 Mar 2014 3:3...
Wasn't trained to teac...	1	1	24 Mar 2014 3:2...	KAP	24 Mar 2014 3:2...
Misconceptions of GCAs	1	8	24 Mar 2014 11:...	KAP	24 Mar 2014 11:...

Appendix 22

22. Researcher Developed Question Scaffolds

Debate of ideas: Tactical Time Outs

In your team or with your peer coach, discuss the following items during your 'tactical time-out':

1.Identify the particular strengths of your opposition? i.e. particular learners, patterns of play, physical strength, good players and flair learners, solid attack/defence etc.

2.What things did you/your pair/team do well to cope with these strengths in the previous game? i.e. forced them away from the goal, we were strong on-the-ball, we moved well to get away from our opponents so they could not tackle us etc.

3.What things did/does you/your pair/team need to do to counteract the strengths of the opposition team? i.e. close the ball down quicker, work in pairs when tackling for the ball, work harder to get free from opponents.

4.How will you do the things you have mentioned in question 3? Can you address in order that you can be effective in the next part of the game? i.e. look to move the ball on quicker by dribbling the ball less and taking less time to control the ball. i.e. get the ball wide so that it spreads their defense and look to play in the gaps between their defenders.

Question Starters

Kagan (2009) provides a list of **'question starters'** for different types of thinking that would assist practitioners:

Decision-making
1a. ***How are you deciding*** what to do with the ball (or projectile) during the game? Decision Making 1b. ***How are you deciding*** what to do with your body position between skill attempts? (Base) 1c. ***How are you deciding*** what skills to execute? (Skill execution)

Assessing
2a. ***How could you improve*** your attack? 2b. ***How could you improve*** your defence? 2c. ***How could you improve*** your attack as a team? 2d. ***How could you improve*** your defence as a team/pair?

Evaluating
3a. ***What is the most important thing*** you need to do in order set up an attack? 3b. ***What is the most important thing*** you need to do in order to defend against an attack?

Drawing conclusions / inferring consequences
4. ***If you*** used... (.... shot, ... equipment, ... placed the ball (projectile), ***what might happen*****?**

Note: the types of thinking and question starters are listed in **italics**; the rest of the verbiage can be changed depending on the context / needs of the practitioner.